

A FEASIBILITY STUDY OF GROUP PARENT TRAINING FOR THE
PREVENTION OF OBESITY (GPT-O) IN AFRICAN AMERICANS

by

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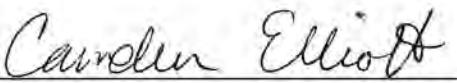
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ABSTRACT

A Feasibility Study of Group Parent Training for the Prevention of Obesity (GPT-O) in African Americans:

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The prevalence of overweight (BMI $\geq 85^{\text{th}}$ percentile for age and sex) has more than tripled in the past three decades (216). Prevalence is elevated among racial and ethnic minorities compared to the Caucasian population (215). Obesity prevention, especially among young children, has become paramount (228; 286). The purpose of this study was to test the feasibility and acceptability of an 8-week group parent training for obesity prevention program (GPT-O) targeting parental self-efficacy in making lifestyle changes. Given limited intervention research among racial minorities, African Americans were specifically targeted. Participants were twenty African American parents and their overweight/obese (BMI z-score $M = 2.46$, $SD = .93$) children ($M = 4.10\text{y}$, $SD = 1.48$, 70% female). Parent participants completed feasibility questionnaires following the intervention. Measures of child participants' body composition were collected at baseline, post-intervention, and three-month follow-up, and compared to a standard-of-care control group. Parents also completed questionnaires regarding parenting and child behaviors at baseline and post-intervention. Retention through post-intervention was 75%. Of these

participants, average attendance was $M = 5.12$, $SD = 2.12$, of 8 sessions. Following the intervention, most parents reported that the group was acceptable (100%) and feasible (78%). Expected BMI change did not differ between intervention and standard-of-care control youth from baseline to post-intervention ($p = 1.0$) or from post-intervention to three-month follow-up ($p = 1.0$). Following the intervention, parents reported improved parenting ($ps \leq .03$) and feeding ($p = .03$) practices, as well as improved child eating-related ($p = .001$), weight-related ($p = .01$), and general ($p = .06$) behavioral problems. Following the intervention, parents reported reductions in children's daily caloric intake ($p = .04$), saturated fat intake ($p = .04$), and added sugars intake ($p = .06$). No changes were observed in parent-reported parenting stress ($p = .71$), lifestyle stress ($p = .76$), general parental self-efficacy ($p = .70$), or self-efficacy specific to parenting an overweight child ($p = .29$). Results suggest that African American parents of overweight/obese children found this intervention to be feasible and acceptable. An adequately powered and controlled trial is warranted to examine the efficacy and potential change mechanisms of GPT-O.

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CHAPTER 1: Background

OBESITY PREVALENCE AND CORRELATES

Prevalence

Obesity in the U.S. is at an unprecedented high. Current estimates indicate that 34% of adults in the U.S. are obese (body mass index, $BMI \geq 30 \text{ kg/m}^2$). More concerning, when rates of obesity and overweight (body mass index, $BMI \geq 25 \text{ kg/m}^2$) are combined, well over half of the population is classified as overweight, with current prevalence estimated at 68% (125). Rates of overweight and obesity differ across racial and socioeconomic categories. Data indicate that the prevalence of obesity is disproportionately greater among racial and ethnic minorities (44% and 38% among black and Hispanic adults) compared to white adults (33%). When examining women only, this discrepancy is particularly apparent, with rates estimated at 33%, 50%, and 43% among adult white, black, and Hispanic women, respectively (125). While the relationship between obesity and socioeconomic status is mixed, most studies indicate that low SES increases obesity risk (317).

Similarly, overweight ($BMI \geq 85^{\text{th}} \text{ percentile for age and sex}$) has tripled in the pediatric population over the past several decades (216). While prevalence rates appear to be leveling (217), 17% of youth ages 2-19y are obese ($BMI \geq 95^{\text{th}} \text{ percentile for age and sex}$) and 32% are overweight (215). Prevalence rates among young children ages 2-5y are lower than youth ages 6-19y, with 10% and 21% classified as obese and overweight, respectively (215). However, overweight among preschool aged youth has, for the first time, increased over the past ten years (216). Although the most recent data indicate that the prevalence of obesity ($\geq 95^{\text{th}} \text{ percentile for age and sex}$) and extreme obesity ($\geq 120\%$ of the 95th percentile) among low SES preschoolers may have dropped minimally, but

significantly in the most recent years (less than 1% point) (221), the high prevalence of obesity observed remains disconcerting as overweight in childhood is predictive of obesity into adulthood (115). Obesity rates in childhood also vary by race and ethnicity. Hispanic boys are more likely to be classified as overweight and obese than are white boys. Similarly, black girls are more likely than white girls to be overweight or obese (215).

Correlates of Obesity Among Adults

Overweight and obesity are associated with a range of medical and psychosocial comorbidities. Among adults, obesity is associated with type 2 diabetes mellitus, coronary heart disease, and increased incidence of certain forms of cancer, respiratory complications (e.g., obstructive sleep apnea), gall bladder disease, hypertension, hyperlipidemia, depression, and osteoarthritis (184). The financial concomitants of obesity are equally broad. It has been conservatively estimated that weight-related disease costs the United States \$75 billion in health care expenditures each year (116).

Further, as both overweight and non-overweight people consider weight a matter of personal control (66; 153), overweight adults are more likely to be negatively labeled (e.g., lazy, stupid, worthless) (306) and commonly experience difficulties in social, work, school, and health-care settings (229). Some (27; 179; 266), but not all (172; 186) studies further suggest an association between obesity and mental illness. A recent large epidemiological study found a positive relationship between elevated BMI and general psychological distress, with both overweight and obese adults reporting higher current and lifetime prevalence of general psychopathology (e.g., mood, anxiety, somatoform disorders) compared to non-overweight participants. Further, obese adults reported higher

rates of mental illness than did overweight adults, suggesting a linear relationship between BMI and mental illness (21). Similarly, a study combining world mental health surveys from various countries indicated an association between obesity and symptoms of depression and anxiety, especially among obese females (256). Studies suggest that overweight and obese adults are also more likely than non-overweight individuals to report body image distress (249; 250). There is evidence that, among adults, body image concerns may increase the likelihood of comorbid obesity and psychological distress (169).

Correlates of Obesity Among Children and Adolescents

Similar disease trends are seen in the pediatric population. While weight-related health co-morbidities were previously observed primarily among adults, increased body fat has been identified as the main causative agent behind an increase in health problems among youth, particularly heightened risk of type 2 diabetes mellitus and cardiovascular disease (139; 311). Other common health problems associated with childhood obesity include endocrine, pulmonary, and gastrointestinal difficulties, as well as disturbed sleeping patterns (343).

Overweight children also experience significant weight-related stigmatization. Negative attitudes towards overweight body shapes are expressed by children as early as preschool (322). These attitudes are clearly present in elementary school-aged children (255), and have worsened in recent years (187). Research consistently shows that children use labels such as “mean”, “stupid”, “ugly”, “unhappy”, and “lazy,” to describe overweight classmates. They also describe overweight peers as having poor academic and social performance (255). Overweight youth are further victimized for their size through

weight-related teasing and bullying (276). Peer victimization of overweight children is also related to decreased interest (277) and enjoyment (111) in physical activity, which may further perpetuate weight gain in this population.

Given the negative experiences reported by overweight youth, it is not surprising that overweight children experience a range of psychosocial difficulties. This relationship is observable as early as preschool, with three-year-old obese males exhibiting more parent-reported conduct behaviors than non-obese males. By age five, obese boys also exhibit greater attentional, conduct, and hyperactivity problems. Further, obese boys and girls experience more social difficulties than non-obese children (142). During middle childhood and adolescence, cross-sectional and longitudinal studies show a relationship between elevated weight and low self-esteem and self-worth (8; 34; 279; 280; 343). Symptoms of depression (104; 255) and anxiety (277; 324) are also associated with overweight in childhood. Further, overweight children and adolescents report lower social acceptance (279), more social anxiety (324), and loneliness (276). Cross-sectional studies with youth reliably show increased reports of body dissatisfaction and disordered eating cognitions (e.g., weight, shape, and eating concerns) among overweight compared to non-overweight children (8; 38; 279). Body dissatisfaction is further evidenced by dietary restraint (291) and attempts at weight loss (114) among overweight youth. Concern over weight and shape increases the risk for symptoms of depression and anxiety and low self-esteem (8; 104).

Summary of Obesity Prevalence and Correlates

In summary, overweight and obesity are at unprecedented rates across all age ranges, and are more prevalent among individuals of racial and ethnic minority. Obesity

and overweight are further associated with a range of medical and psychosocial issues for individuals of all ages.

THE ENERGY BALANCE MODEL

The energy balance model (159) proposes that two primary factors determine weight: intake and expenditure. Intake revolves around a variety of hormonal, environmental, and socioemotional factors. Expenditure is similarly multifaceted, including physical activity, basal metabolic rate, and adaptive thermogenesis (270). According to this model, weight gain occurs when energy intake exceeds energy expenditure.

Genetic Influences on Body Weight

A review of studies suggests that 60-70% of body weight is determined by genetic factors (301). Data indicate that child-parent and child-sibling body weight are correlated, suggesting that this relationship is in part genetically determined (197). Twin studies have shed the most light on the heritability of body weight. When overfed a controlled amount of calories, monozygotic twin pairs gain analogous amounts of weight. However, significant differences between different twin pairs in weight gain points to increased susceptibility of some individuals toward increased BMI when overfed, and clearly points to a genetic component of BMI. Similarly, whether reared apart or together, monozygotic twins have a similar body mass index later in life, further highlighting a significant role of genetic influence in determining energy balance (9; 285).

While the genetic underpinning of weight is well-established, research examining specific genetic pathways is emergent. One study found the rate of eating (bites/min) to be highly heritable and associated with overweight among twin children ages 10-12y

(195). In recent years, a well-founded relationship has been established between single nucleotide polymorphisms in the *FTO* gene, rs9930506, and increased risk for overweight and obesity, among both adults and children with the risk A allele, compared to those without the risk allele (TT). Notably, children with the risk allele are more likely to become overweight or obese with age (130; 257). The risk allele is associated with decreased satiety (320), greater intake assessed with self-report (310) and at a laboratory test meal (49), and disinhibited eating behaviors (293), compared to youth without the risk allele. These data suggest that eating patterns may, in part, explain the relationship between the *FTO* variant and weight.

Metabolic Influences on Body Weight

Studies with Pima Indians, a population highly susceptible to obesity, show that while all individuals studied expended more metabolic energy as they gained weight, expenditure varies individually, and those with a lower metabolic rate relative to others their same size gain more weight over time (233). Similarly, individual differences in respiratory quotient, a concept used to determine the relative amount of energy derived from carbohydrate and fat, is related to likelihood of weight gain. A third factor impacting energy expenditure is spontaneous physical activity. Spontaneous physical activity has also been referred to as non-exercise activity thermogenesis, or the thermogenesis from activity other than voluntary exercise (e.g., fidgeting, maintaining posture when not lying down) (190). Spontaneous physical activity is lower in obese subjects and predicts weight gain over time. Importantly, individual differences in metabolic rate, respiratory quotient, and spontaneous physical activity show familial similarities, suggesting that these are largely genetically determined factors that have an

impact on body weight (233). It is conservatively estimated that energy expenditure factors explain 25-30% of the genetic factors contributing to obesity (301).

Hormonal Influences on Body Weight

Recent years have evidenced insight into the hormones explaining appetite and satiety. The forerunner of these hormones, leptin, is derived from adipose tissue. Leptin acts on the brain to decrease appetite and increase energy expenditure. Conversely, the absence of leptin signals starvation, resulting in hyperphagia and decreased physical activity. Leptin further initiates the melanocortin pathway in the hypothalamus, in which polypeptide POMC produces melanocortin peptides (α, β , MSH), which in turn stimulate melanocortin-4 and melanocortin-3 receptors to effect feeding reduction. Although very rare, genetic defects in leptin, the leptin receptor, and other variables in the leptin-melanocortin pathway result in extreme obesity (188). Heterozygous, or partial efficiency in leptin and other factors in the leptin-melanocortin pathway are further associated with increased risk for obesity (126; 188). However, among several studies, partial mutation yielded less obese parents than children, suggesting that these heritable deficiencies may be further activated by an environment promoting overeating (188).

Critical Periods of Development for Body Weight

Much research has focused on critical periods of development that may predispose to obesity. Research in recent years has unearthed a number of perinatal factors associated with later obesity risk. Maternal overweight and obesity prior to pregnancy is associated with high infant birth weight and/or large for gestational age, which are both predictive of future obesity (254). One review of the literature found maternal overweight or obesity to be the strongest predictor of child obesity, among a

number of potential perinatal risk factors (47). Similarly, maternal gestational weight gain also prospectively predicts child BMI into early adulthood (20; 254). Mechanistically, research on this topic is emergent. Animal models suggest that a high-fat, high-sugar diet during pregnancy results in child increased adiposity, hyperphagia, insulin resistance, and hypertension prospectively. In theory, overfeeding or obesity during pregnancy may permanently alter the development of components involved in later energy-balance regulation, namely in areas of the hypothalamus involved with appetite regulation, hormones and peptides involved with this process (e.g., leptin, insulin, POMC, NPY), and in the development and differentiation of adipose cells (7; 47). Further data collected via animal models implicate the post-natal lactation period as critical in realizing the effects of the perinatal environment. Specifically, offspring of mothers fed a high-fat diet during pregnancy exhibited hyperphagic characteristics and associated weight gain with growth, but only when maternal exposure to a high-fat diet continued during the lactation period (7). Further, there are data to suggest that epigenetic mechanisms may be at play in these relationships, with alterations evidenced in pancreatic genes (impacting insulin) as well as POMC and insulin receptors, among others (7).

Notably, on the opposite end of the spectrum, research also suggests that infants born with a low birth weight and/or small for gestational age are at increased risk for the development of obesity (162; 265). While more research is needed to determine the mechanism behind this relationship, it has been suggested that rapid gain in weight post-birth, known as “catch up weight,” in combination with intrauterine alterations in insulin sensitivity, may predispose toward obesity (219).

In summary, while research examining the mechanisms of action behind these relationships continues to evolve, these data suggest that peri- and post-natal factors, potentially including maternal weight, infant weight, gestational weight gain, and diet, may predispose, or “program,” systems involved in the energy balance model later in life.

Additional research has focused on other post-natal factors that may impact body weight. There are some data to suggest that breastfeeding is a protective factor. The mechanism behind this relationship remains unclear. It has been proposed that infants who are breastfed develop better self-regulation abilities with respect to feeding, and due to early exposure to a variety of flavors via breast milk, may have a more diverse palate (241). Other potential explanations include increased overall and protein-related intake among formula-fed infants, which may be associated with greater weight gain (208). In studies examining the relations between early feeding and weight, formula feeding (compared to breast feeding) has been predictive of higher child BMI in most, but not all studies (241), and a systematic review of the literature indicates a positive effect, even when controlling for potential confounding variables, such as maternal BMI and smoking (208). Historically, child adiposity has been consistently inversely associated prospectively with breast feeding (241), although a recent, well-controlled longitudinal study directly targeting breast-feeding in obesity prevention did not support breastfeeding as a protective factor against obesity (200). Notably, in recent longitudinal studies, breastfeeding is associated with healthier eating habits in adulthood (76; 242).

In addition, differences in feeding patterns are observed as early as infancy and longitudinally predictive of body weight. Stunkard and colleagues found that infant sucking rate was predictive of weight gain at age two years. At baseline, infants of obese

mothers (considered, “at-risk”) had a 50% higher sucking rate than those of non-obese parents, potentially suggesting early behavioral manifestations of overeating patterns (284).

Another identified critical period of growth occurs between approximately three and seven years of age, during a period known as adiposity rebound, when BMI is at its lowest point, following the increase of BMI that occurs after the first year of life (83). A number of studies have linked early adiposity rebound to increased risk of obesity, as well as to negative health co-morbidities such as type 2 diabetes and high blood pressure. Data indicate that early rebound is linked to increased weight and fat gain over time (304; 333). Although timing of adiposity rebound appears to be somewhat genetically determined (206), evidence also suggests that environmental factors are at play. Notably, a review of retrospective studies suggests that lower physical activity and greater sedentary behavior is associated with earlier adiposity rebound (304).

Environmental Influences on Energy Intake and Output

While genetic factors certainly play a role in determining obesity, the drastic increase in the prevalence of pediatric overweight over the past few decades cannot solely be attributed to genetic factors. Rather, an inherited genetic set of metabolic and hormonal factors, in the context of an environment with ample high calorie foods and minimal physical demands, has likely yielded the development of wide-spread obesity (270).

Indeed, the past several decades have evidenced the rapid development of an environment that may promote obesity. Since 1970, there has been a per capita increase in energy (i.e., caloric) availability (152). Further, survey studies indicate that total

energy intake increased by approximately 200 calories per day between 1977-1996. Of note, there were particular increases in food and drinks high in fat and/or calories, such as soft drinks, pizza, and desserts (212). This simultaneous increase of food availability and daily intake suggests that Americans are consuming more food.

An increase in food portion sizes may, in part, explain the increase in overall energy intake (211). Laboratory paradigms show that individuals' caloric intake increases as serving size increases in adults (244), young adults (192), and children (243). Interestingly, intake of children ages 2-3 years does not significantly vary depending on portion size, whereas children ages 4-6 years eat approximately 60% more when the portion size is doubled (243). This suggests that young childhood may be a key turning point in self-regulation of energy intake. Studies examining the restaurant industry indicate that serving sizes have increased continuously over the past three decades (211), exceeding federal recommendations by approximately 200-500% (342). These trends are especially disconcerting as Americans currently eat more meals outside of the home than in the past (152). However, these trends are not exclusive to dining out. Even within the home environment, there is evidence of increased food consumption and portion sizes (211). Interestingly, even cookbooks with established recipes, when reprinted more recently, indicate a fewer number of servings per recipe than in the past (342).

Accompanying this increase in energy intake is a simultaneous decrease in voluntary physical activity (Hill, 2006). The majority of adults within the United States self-report that they do not engage in regular physical activity (45). Similarly, among children, active transport (e.g. walking, bicycling) (313) and daily physical education (86), have declined significantly. Simultaneously, time spent in sedentary activities (e.g.,

TV, computer, internet) are increasing (37). In sum, there has been an increase in food availability, portion size, and calories consumed within the United States over the past several decades, accompanied by a net decrease in physical activity. These changes may, in part, account for the exponential increase in overweight and obesity.

A final factor that has received some attention in recent years is the “social contagion” epidemiological theory of obesity, which suggests that obesity risk could be transmitted through social relationships. One study examined a social network over the course of 32 years and found that obesity clustered into social networks. Individuals were more likely to become obese if they had an obese friend, sibling, or spouse (52). However, when this model was re-evaluated controlling for environmental factors, it was not supported, returning attention back to environmental influences (53). Indeed, other evaluations using an epidemiological approach point to disproportionately increased prevalence of fast food restaurants in low SES neighborhoods (236), as well as disproportionately lower access to supermarkets and healthy food options (71). These data suggest that obesity prevalence is greater among populations exposed to an obesogenic environment.

Summary of the Energy-Balance Model

In summary, the energy-balance model proposes that obesity occurs when energy intake is greater than energy expenditure (159). While a number of genetic and early life factors have been identified in explaining individual differences in body weight, these factors alone cannot explain the rapid increase in obesity that has been observed over the past several years. Rather, genetic factors predisposing toward obesity, facilitated by

societal trends toward easy access to high calorie foods and low physical demands, has likely jointly contributed to the observed obesity trends.

PSYCHOLOGICAL CONTRIBUTORS TO OBESITY: DISINHIBITED EATING

Binge and Loss of Control Eating

In recent years, the relationship between disinhibited eating patterns and overweight has received increasing attention. Binge eating, defined as the consumption of an objectively large amount of food while experiencing a loss of control (LOC) over eating (10), is the most prevalent type of disordered eating pattern among obese adults (78; 296). Binge eating disorder (BED) is characterized by recurrent binge eating episodes. BED is further associated with a variety of psychosocial difficulties, including mood disorders, low self-esteem, body image concerns, disordered eating cognitions (e.g. concern over shape and weight), and poor social functioning (332). BED is prevalent in the overweight and obese population, ranging from 3% among overweight adults in a community sample (268), to 29% among adults seeking weight loss treatment (271).

Among African Americans, BED is the most prevalent eating disorder (303), with prevalence of recurrent binge eating or BED equal to, if not more prevalent, among African American, compared to Caucasian women (199; 283) with the exception of one study (282). Notably, BED is similarly associated with psychological comorbidity and obesity status when examining Caucasian and African American women, with some evidence to suggest that this relationship may be more robust in African American women (199; 226). Interestingly, a recent national study with African Americans showed that BED was significantly associated with unemployment (303), which may be explained by the stress associated with joblessness.

Retrospective data indicate that adults with BED often recall binge episodes first occurring in middle childhood or adolescence (e.g., (143). Accordingly, while full-syndrome BED is minimal during childhood (1-6% among obese weight loss treatment-seeking youth) (138), sub-threshold binge eating is prevalent (289). Further, during youth, the experience of LOC over eating, regardless of amount of food consumed is a salient marker of disordered overeating (262). For this reason, while binge eating (intake of an objectively large amount of food accompanied by the experience of LOC) has remained the focus of research among adults, pediatric research broadly examines the experience of LOC over eating, independent of the amount of food consumed. LOC eating is more prevalent among overweight and obese children, ranging from 15%-30% (191; 209; 291). Akin to adults with BED, LOC eating in youth is associated with increased levels of eating, weight, and shape concerns (80; 133; 300), symptoms of depression (24; 291) and anxiety (133), low self-esteem (80), social problems (95), and parent report of problem behaviors (e.g. mood problems, social difficulties, breaking rules, aggressive behaviors) (133), compared to youth not reporting LOC eating.

Affect theories propose that LOC eating serves as a way of coping with negative emotional states. In other words, food is used as a method of avoiding or coping with negative emotions related to a poor view of the self (156) or social difficulties (329). In accordance with these models, adults with BED often experience LOC in response to negative mood states (6). Furthermore, adults with BED are more likely to eat in response to negative emotions compared to overweight and obese adults without BED (94; 201). Although studies specifically with African American adults are limited, in support of affect theory, perceived stress and emotional eating were associated in an investigation of

urban, African American woman (267). Notably, this relationship was strongest among participants who were overweight or obese, and related to intake of sweets. Similar data have been found in children. For example, cross-sectional data show that youth reporting LOC eating have difficulty regulating negative emotions (73), and among a racial and ethnically diverse sample, are more likely to eat in response to adverse emotion when compared to youth without LOC eating (298). Additionally, both boys and girls report that negative emotion commonly precedes LOC eating episodes (292).

Based on the energy-balance model of obesity (159), food used for emotional coping in the absence of hunger should lead to excess energy consumption and subsequent weight gain. In support of this notion, adults with BED consume more energy at binge and non-binge meals and exhibit more erratic eating patterns compared to individuals without BED (332). Further, retrospectively, for some individuals with BED, binge eating begins when individuals are of normal weight, but is associated with the onset of overweight (235). Finally, binge eating cessation during treatment is associated with modest weight loss (144; 332). Together, these data indicate that, in adults, binge eating contributes to excess caloric consumption and subsequent development and/or maintenance of overweight.

Studies with younger populations show similar trends. Obese treatment-seeking youth reporting LOC eating are more likely than those without binge eating to have a carbohydrate-rich diet (196). Similarly, in the laboratory, youth with LOC consume more high-calorie snack and dessert-type foods, and less protein-rich foods than do youth without LOC (295). These dietary patterns may be associated with less post-meal satiety, leading to increased caloric consumption and weight gain over time. Further, overweight

girls with LOC consume more calories than do overweight girls without LOC. In sum, these data suggest that engaging in LOC episodes may contribute to excessive caloric intake, leading to weight gain over time.

Accordingly, a link between LOC eating and weight is evident during childhood and adolescence. For example, LOC eating is predictive of weight gain (273) and obesity (274). Similarly, among youth at risk for overweight, baseline report of LOC eating predicts fat (290) and weight (299) gain over time. In a study of both normal and overweight children and adolescents, LOC eating predicted future weight gain for boys (113).

Eating in the Absence of Hunger and Emotional Eating

Another important construct likely related to increased obesity rates is termed eating in the absence of hunger (EAH). EAH, another form of disinhibited eating, is a broad term, encompassing both eating in response to an external cue (e.g. sight, smell of food) or to an emotional stimulus (314). Eating in response to an emotional stimulus is commonly termed emotional eating, and is specifically described as “eating in response to a range of negative emotions such as anxiety, depression, anger, and loneliness, to cope with negative affect” (107). EAH is associated with overweight in adults (22), adolescents (263), and children (109; 120; 158; 207). EAH, particularly in response to negative emotion, is more common among adults (332) and children (297; 298) reporting LOC. However, while EAH and LOC commonly co-occur, EAH is also observed among individuals not reporting LOC. Therefore, EAH is considered an important and distinct form of disinhibited eating that has an impact on body weight regulation.

Data suggest that young children have an innate ability to self-regulate energy intake (25). This ability, however, varies between children, decreases with age, and is related to body weight (294). Among preschool girls, poor compensation for a pre-meal juice drink is related to overweight (173). Similarly, in a group of children ages 3-6 years, girls', but not boys', EAH after reaching satiety was related to weight-for-height ratio. Among five-year-olds, most children eat in the absence of hunger, but overweight youth consume significantly more calories than do non-overweight youth. Further, youth reporting EAH at age five are more likely to report EAH and to be overweight at age seven, suggesting that EAH is a stable trait that may be linked to maintenance of overweight over time. These data indicate that all youth are responsive to environmental cues to overeat (e.g. larger portion sizes), but that a subtype of youth may be particularly vulnerable to overeating and subsequent weight gain (119).

Evidence suggests that EAH is a modifiable behavior in early childhood. Conditioning preschoolers to eat in response to external cues (e.g., time, rewards) results in greater consumption of snack foods following a yogurt pre-load, which is suggestive of decreased ability to self-regulate caloric intake. In contrast, educating preschoolers about hunger and satiety facilitates appropriate consumption of snack foods following high and low-calorie yogurt pre-loads, indicating improved self-regulation (25). Using a similar technique, Johnson and colleagues showed that preschoolers can be taught to improve compensation for a pre-snack drink by 40%, on average (173).

Other studies have more specifically examined emotional eating among young children. While undereating, rather than overeating, is a more common response to negative emotion during young childhood, emotional eating is prevalent, at

approximately 25% among five-year old girls (44), and becomes more prevalent with age (15). In a sample of children ranging from 3-5 years, emotional eating was also observed in a laboratory setting, following a negative mood induction (28). Emotional eating in young childhood may be facilitated by familial and environmental factors, as preschooler emotional eating is related to parent use of food for emotion regulation (28). While data examining the relationship between emotional eating and weight in young children specifically are scarce, emotional eating is positively associated with overweight among youth ranging from ages 3-13 years (316).

Summary of Disinhibited Eating

A variety of disinhibited eating behaviors (binge/LOC eating, emotional eating, EAH) are observed across the age span and are salient among individuals of racial and ethnic minority. While LOC eating is rarely reported by young children, EAH is common and theorized to be an early indicator of other disinhibited eating patterns more commonly seen in adulthood (120). From an early age, disinhibited eating patterns are prevalent, related to overweight, and contribute toward weight gain with age (119). Together, these data suggest that, from an early age, disinhibited eating behaviors may be an important factor in weight regulation.

SELF-REGULATION: POSSIBLE LINKS TO OVERWEIGHT

Self-Regulation

Self-regulation involves the capacity to modulate reactions to environmental stimuli through attentional and behavioral processes (246). Emotion regulation, one aspect of self-regulation, is the process of coping with heightened levels of positive and negative emotions (185). Like general self-regulation, emotion regulation also involves

the regulation of attention, namely refocusing and shifting attention, while controlling behavior. Deficits in behavioral control can be further categorized as reactive overcontrol (e.g. inhibition) and reactive undercontrol (e.g. disinhibition or impulsivity) (246). In general, well-regulated individuals are thought to be able to employ a variety of flexible, socially-appropriate regulatory behaviors, while avoiding over-control and disinhibition (58).

During childhood, there is a considerable body of literature linking self-regulation to both behavioral and emotional problems. Deficits in self-regulatory abilities are risk factors for poor adjustment. For example, attention-deficit hyperactivity disorder is associated with self-regulation difficulties in maintaining attention and inhibiting disruptive behaviors (19). Further, difficulties with self-control and attention are associated with mood and behavioral problems (e.g., aggression, rule-breaking) during childhood (90). Compared to children who effectively regulate emotion, those who do not demonstrate poorer social functioning, more destructive coping skills, and lower social competence in school, as well (91).

Self-Regulation and Eating Behaviors

Poor self-regulation may relate to obesity by promoting impulsive eating behaviors and reducing the ability to regulate or delay intake of pleasurable foods (141). Behaviorally, this tendency may manifest as disinhibited eating patterns, such as binge/LOC eating, emotional eating, or EAH. Within the adult population, a review of the literature indicates correlations between overweight and poor self-regulation. More specifically, obese and overweight individuals are more likely than non-overweight individuals to score high on impulsivity (i.e., emotional and behavioral disinhibition)

questionnaires and to exhibit preference for immediate reward, suggesting difficulty with delay of gratification (210). Impulsivity, particularly in response to negative emotion, is also associated with disinhibited eating behaviors (75).

There is overlap between binge/LOC eating and impulsivity-related behavioral problems associated with disinhibition. For example, binge eating often co-occurs with pathological gambling, alcohol/substance abuse, and other impulse control disorders among adults (e.g., antisocial personality disorder) (Kane, Loxton, Staiger, & Dawe, 2004; Fisher & Smith, 2008; Fernandez-Aranda, 2008). This relationship is also evident in adolescent samples. For example, behavioral problems associated with poor control (e.g., aggression, suicide attempts, sexual disinhibition) correlate with LOC eating patterns (177; 308). Prospectively, behavioral indicators of impulsivity (e.g., shoplifting, hitting others) predict the onset of binge eating behaviors in adolescent females (337). Given these correlations, researchers propose that an underlying predisposition towards impulsivity and emotional reactivity make some individuals more vulnerable to addictive and external problem behaviors, in order to cope with negative feelings (117).

Several studies have examined the link between self-regulation, eating, and obesity during middle childhood. Youth with Attention Deficit Hyperactivity Disorder are at increased risk for overweight compared to youth without the diagnosis, or those with the diagnosis who are on medication (323). There is further evidence of high reward sensitivity and lower levels of behavioral inhibition among obese youth, compared to non-obese youth (210). Interestingly, in this same study, obese youth with self-reported LOC eating behaviors exhibited more impulsivity than obese youth who did not report LOC eating (210). Similarly, youth reporting LOC eating are less adept at regulating

negative emotion, compared to those who do not report LOC eating (73). Finally, longitudinal data show that children rated by parents and teachers as having more self-control (e.g., impulse control, delay of gratification) at age nine years were less likely to be overweight at age 15 years (312). These data suggest that self-regulation may facilitate weight control with age. Notably, difficulties with self-control and impulsivity may underlie some of the behavioral traits evident among overweight and obese youth, such as elevated responsiveness to environmental food cues (210).

Few studies have examined the link between overweight and self-regulation in young children. Seeyave and colleagues showed that youth who fail a task of delayed gratification at age four years are more likely to be overweight at age 11 years (259). Graziano and colleagues longitudinally examined the relationship between self-regulation and weight status in boys and girls at ages 2 and 5½ years, using a variety of tasks designed to assess both behavioral (e.g., attentional control, reward sensitivity, inhibitory control) and emotional (e.g., distress reaction, self-soothing, distraction) indices. At age two years, children with more behavioral problems and less inhibitory control/high reward sensitivity were more likely to be overweight. Over time, when controlling for baseline BMI, demographic variables, and behavioral problems, children with better emotion regulation skills at age two years were less likely to have an increase in BMI at the 5½ year assessment. Further, and most importantly, children classified as overweight or obese ($BMI \geq 85^{\text{th}}$ for age and sex) at age 5½ years had significantly poorer emotion regulation and inhibitory control skills at age two years, when compared to those classified as non-overweight at age 5½ years. These data provide preliminary evidence to

suggest that poor self-regulation in young childhood is both associated with overweight and predictive of weight gain and onset of overweight with age.

Self-Regulation Summary

Taken together, data suggest that difficulties with self-regulation may relate to overweight and obesity in two primary ways. To begin, those with poor impulse control and high reward sensitivity in an environment in which copious amounts of highly palatable foods are available may be more susceptible to eating in response to environmental food triggers. Further, a tendency toward impulsivity and emotional reactivity may make some individuals more vulnerable to a variety of addictive and external problem behaviors, including dysregulated eating behaviors, such as emotional and binge eating. The correlation between self-regulation and overweight can be seen throughout the age span, as early as two years of age, and may increase risk for excessive weight gain with age.

OBESITY SUMMARY

The rates of overweight and obesity remain very high (125; 215). Obesity also has a significant medical, psychosocial, and financial impact. Across all ages, overweight and obesity are associated with health problems (184), weight-related stigmatization, and emotional distress (21; 229; 255). Overweight and obesity trends have resulted in considerable research examining the factors contributing to excess adiposity. In addition to genetic factors, environmental factors are also at play (270). In addition, data suggest that variations in aspects of self-regulatory capacities may contribute to individual differences in overeating behaviors (141).

TREATMENT OF OBESITY

In accordance with the energy balance model, behavioral treatments of obesity focus on lifestyle changes, such as refining dietary habits and increasing energy expenditure. A myriad of dietary changes have been examined. These efforts range from focusing on reduction of caloric consumption from one food group (e.g. fats, carbohydrates), to encouraging an increase healthy food intake (e.g. fruits, vegetables, whole grain products), while simultaneously decreasing consumption of food high in fat and calories. Exercise, either independently or in group format, is often targeted as a way to increase energy expenditure for effective weight loss (339). Interventions also commonly include psychological principles associated with behavior change, such as self-monitoring, reward, and goal-setting, to increase motivation and maintain weight loss (151; 332). While combined diet and exercise interventions are successful in effecting short term weight-loss in adults, weight-regain post-treatment is common, and weight maintenance is the exception, rather than the norm (339). In light of such data, weight loss interventions during adulthood are considered challenging and largely unsuccessful (170).

However, intervening during youth may be more effective, as a reduction in BMI may be more easily attained by maintaining weight during growth (85). Indeed, lifestyle interventions in childhood show short- (331) and long-term (102; 170; 331) effectiveness. There is further evidence that targeting sedentary activity, with a particular focus on television and computer use, is efficacious (85; 100).

Family-Based Obesity Intervention in Middle Childhood

Within the pediatric weight-loss literature, the efficacy of family-based interventions for achieving short-term pediatric weight loss is well-established (98). Family-based interventions generally focus on facilitating parent implementation of techniques such as reinforcement, stimulus control, and improving access to healthy foods and activity, which in turn creates an environment that is thought to promote and maintains weight loss (98). A number of studies have involved whole families, and others have targeted parents-only as agents of family-based change.

Epstein and colleagues have completed a number of studies with youth in middle childhood using the Traffic Light Diet (101), which is a child-friendly color-based food system used to implement healthier eating patterns. “Green light” items are low in fat and high in nutrition and encouraged to be increased, “yellow light” items are moderate on nutrition and fat, and encouraged to be eaten with caution, and “red light” items are high in fat/sugar and low in nutrient density, and are encouraged to be decreased. Families are encouraged to have “green light” items easily accessible within the home, and to limit access to “red light” items. Children are rewarded for adhering to this system. Long-term follow-up assessment of this program showed that targeting parents and children together was significantly more effective than a child-only and control group at five-year follow-up and significantly greater than the control group at ten-year follow-up. Further, the number of children in the parent-child group maintaining a minimum of 20% reduction of overweight at the ten year follow-up was nearly double that of the child-only group. Support from family and friends and the number of meals eaten at home were both identified as predictors of weight loss maintenance (102). Epstein and colleagues have supplemented their basic nutrition plan with various cognitive and behavioral strategies,

such as problem-solving (97), and increasing physical activity and sedentary activity (99; 103), for example. Further, additions to this program involving social support and cognitive behavioral skills have shown short-term effectiveness in maintaining weight loss following treatment (330).

Israel and colleagues have conducted a series of studies involving middle childhood aged children and parents in obesity treatment. Their treatment program was based off of the “CAIR” model, which includes parental monitoring of cue control (C), physical activity (A), food intake (I), and administering rewards (R) for achievement, such as staying within the prescribed calorie limit. Parents also received general child behavior management training. Within one condition, parents were the primary agents of change, in that they were in charge of monitoring children and enforcing homework completion. The other arm targeted children as primary agents of change, via self-regulation education, including goal-setting, self-monitoring, self-evaluation, and self-consequences. Following the intervention, prevalence of obesity declined in both conditions, and there was no interaction by treatment arm. Although treatment effects did not remain over a six-year follow-up period, children in the enhanced self-regulatory group maintained weight better than those not in the enhanced condition (164). In another study, behavioral weight loss skills were supplemented in one group by general parent-training. Although participants in both groups had greater weight loss at follow-up compared to the control group, maintenance of weight loss was better for children whose parents received the parent training condition at the one year follow-up (165).

Other research has focused on the use of family therapy in obesity intervention. Flodmark and colleagues compared two groups of parents and obese children ages 10-11

years receiving dietary counseling, with one group also receiving family therapy, to a control group. The children involved in family therapy maintained their weight better than both the comparison and control group at a one-year follow-up assessment (127). Similarly, Nowicka and colleagues implemented a brief family therapy intervention within a multidisciplinary primary care setting with children ages 6-17 years, and showed reduction in BMI z-scores following the intervention (214).

Golan and colleagues have targeted parents-only in family based change. In a six-month intervention encouraging healthy eating (e.g., increased availability and serving of fruits and vegetables), increased physical activity, decreased sedentary activity, and techniques for approaching feeding in an authoritative manner, Golan and colleagues compared targeting parents-only to targeting children-only in effecting family-based change. At a seven year follow-up assessment, the parent-only group was significantly more effective than the child-only group, with 29% and 20% mean reductions in overweight, respectively (134). These data suggest that parent-only interventions may be as effective as targeting children in concert with their parents (135), especially for pre-pubertal children (168). Intervening with parents-only may also have the added benefit of reducing child-perceived weight-related stigmatization.

Summary of Obesity Intervention

In adulthood, long-term weight maintenance following loss is difficult (339), but interventions targeting children are more optimistic (98; 331). For children, involving parents in treatment appears to be critical for long-term success (98). Family-based interventions generally focus on improving dietary intake and energy expenditure, as well

as facilitating parents in implementing behavioral techniques to facilitate weight loss and maintenance (98).

PEDIATRIC OBESITY INTERVENTION: WHY PARENTAL INVOLVEMENT MATTERS

Background

A number of studies have evidenced a link between child and parent weight. Evidence suggests that parental involvement in treatment improves long-term outcome (102; 134). Importantly, when parent weight change is also examined, it prospectively predicts child weight change (338), suggesting that environmental factors shared by parents and children may be important points of intervention.

Within the home, parents decide food availability and how foods are served. There is evidence that the availability of fruits and vegetables within the home is associated with children's consumption of such foods (225) and negatively associated with fat intake (123). By providing healthy food options within the home, parents may facilitate children's preference and consumption of such foods (253).

Parental Feeding Practices

Parent feeding practices may also influence children's eating patterns and weight status (223). As parents of overweight children are often concerned about their child's weight (272), they may opt to control child eating behaviors to facilitate healthy eating (180). However, controlling feeding practices, such as restriction of unhealthy foods, is correlated with overweight status (112), and among youth at-risk for overweight, longitudinally predictive of weight gain (108). Parental food restriction is also associated with increased child consumption of such foods when access is granted (118), and longitudinally, promotes eating outside of physiological hunger (119). Similarly,

pressuring or rewarding children for the consumption of undesired, but healthier foods, is ineffective and may result in decreased preference for such foods (251). Pressuring children to eat (44) and feeding in response to negative emotion (28) are also associated with emotional eating (28; 44). In light of such data, controlling feeding practices may alter children's sensitivity to hunger and satiety cues, subsequently altering self-regulatory eating abilities (253), thus promoting weight gain over time. However, these data must be interpreted with caution, as most studies have been correlational in nature, hence limiting causal interpretations (315).

Parental Modeling in Eating and Activity

In line with development theories emphasizing the role of vicarious learning and modeling (16), parents may also influence children's eating and activity behaviors, both negatively and positively, through modeling. Parents' and children's intake of healthy (123) and unhealthy foods (36), as well as activity and inactivity levels (129) correlate, suggesting that the health of a parent's lifestyle is reflected in that of their child's.

Research specifically examining the effects of parent modeling indicate that intentional modeling of healthy eating behaviors is associated with children's fruit and vegetable intake (225) and low-fat eating patterns (309). Children are also encouraged to try new foods after watching their parent do so (23). Taken together, parent modeling of healthy eating and activity behaviors may serve to effectively promote similar child practices (36; 319).

As discussed previously, EAH is a behavior commonly linked to overweight. EAH may also have a familial link. For example, children of parents who eat in response to negative emotions are also more likely to reflect this eating behavior (36). Among

preschool-aged youth, mothers' engagement in disinhibited eating practices (e.g., eating in response to food availability or negative emotion) is significantly related to daughters' EAH and weight-for-height ratio (72). These data indicate that parent disinhibited eating significantly impacts child weight status. Similarly, mothers who report disinhibited eating patterns are more likely to have children who are less able to self-regulate energy intake during ad-libitum snack intake following a juice preload (173).

Summary

In summary, the family environment has a significant impact on the development of health behaviors during childhood (223). In light of these data, incorporating parents in child weight-loss intervention is considered critical (205; 334). According to best practice recommendations, parents may promote a healthy lifestyle by setting appropriate meal and snack times, providing a range of healthy food options, and modeling healthy eating and activity behaviors for their children (136).

PARENTAL INFLUENCES ON CHILD SELF-REGULATION

Parents also have a significant impact on children's weight indirectly, via an impact on children's self-regulatory abilities, which as previously discussed are thought to relate to dietary disinhibition (259). In theory, a warm, caring approach to parenting fosters effective self-regulation, which in turn leads to less risk for anger and frustration, and subsequent decreased risk for problem behaviors (92). Indeed, a sensitive, responsive, and directive, yet encouraging approach to parenting is associated with positive development of self-regulating abilities, while negative parenting practices, marked by excessively controlling styles characterized by anger, harshness, and criticism, are related to reduced ability to self-regulate (178). Longitudinal studies further support

this notion. For example, parental nurture/support predicts child self-control, which, in turn, is negatively related to internalizing problems (e.g., depression, low self-esteem) (35). Similarly, positive parenting in childhood predicts child self-regulation two years later, and reduced risk for aggression in adolescence (92).

The association between parenting practices and child self-regulation is further substantiated by the efficacy of parenting interventions for problem behaviors during childhood. For example, a parent-training intervention administered to an ethnically diverse, lower-socioeconomic group through Head Start, focusing on positive parenting skills (e.g., limit setting, praise, and encouragement), effective discipline strategies, and problem solving, improved parenting behaviors and reduced children's problem behaviors and negative mood at post-group and one-year follow-up, when compared to a control group (326). A thorough review of the literature on behavioral family interventions further indicates that targeting similar parenting variables associated with positive parenting practices and effective discipline (e.g., frequency of positive interactions, reinforcement and praise for positive behavior) is effective in managing children and adolescents with a variety of behavioral problems, including oppositional defiant disorder, conduct disorder, and attention deficit hyperactivity disorder, among others (305).

Summary

Evidence suggests that parenting style has an impact on child self-regulatory abilities, and in turn, child problem behaviors. A warm, caring, and sensitive, yet direct approach to parenting is associated with improved child regulation. Notably, evidence

suggests that parenting style is a modifiable factor that can be targeted in intervention efforts to improve children's behavioral problems.

PARENTAL SELF-EFFICACY AND PARENTAL STRESS

One factor considerably related to parenting practices and child adjustment is parental self-efficacy (174). Parental self-efficacy is a component of self-efficacy identified in Bandura's social cognitive theory (16), broadly defined as the expectation caregivers hold about their capability to successfully manage their children's problems (77; 174). In theory, parental self-efficacy influences child development through modeling and promotion of positive behaviors (18). Indeed, in studies from infancy through adolescence, parental self-efficacy is inversely related to inconsistent parenting and disciplinary practices and positively associated with constructive parenting skills (e.g., warmth, involvement, positive modeling) (174). Parenting behaviors, in turn, have an impact on children's adjustment and success outside of the home (13).

Research specifically examining African American parents is limited. Studies have evidenced a cross-sectional relationship between low financial resources and low parental self-efficacy, and in turn impaired goal setting to facilitate adequate child development (35). Lower parental self-efficacy has also been associated with difficult child temperament (232) and behavior problems, as well as with strict and inconsistent discipline tendencies (148), in urban, low-income populations. Importantly, improving parent knowledge can have beneficial effects on self-efficacy, even when income levels do not change. One study with low-income urban parents whose children were enrolled in HeadStart showed that administering a parent education intervention improved parental self-efficacy, which in turn related to children's academic functioning (258). Similarly,

another study targeting Hispanic and African American low-income families in an urban area targeting parenting practices showed improved parenting practices, parental self-efficacy, and child behavior following the intervention, compared to the control group (146). These data suggest that self-efficacy is a relevant component related to parenting practices and child outcome among African American and low-income families that can be effectively targeted in intervention efforts.

One factor that has a significant impact on parental self-efficacy is perceived parent stress. Generally, parents experiencing more stress report feeling less self-efficacious in overall parenting abilities (174). In support of this perception, various forms of stress (e.g., occupational stress, financial stress, parenting stress) are related to negative parenting practices and subsequent child maladjustment. For example, among adolescents, parents' perceived work pressure is related to increased parent-adolescent conflict, lower adolescent self-worth and depressive symptoms (70), and adolescent problem behaviors (e.g. school misconduct, drug use) (131).

The relationship between economic stress and parenting has received much attention. In theory, persistent financial stress increases caregiver distress, and in turn, negatively impacts parenting practices (61). In support of this model, data with adolescents indicates that economic stress is associated with parent stress, which relates to parent-child conflict over financial issues, as well as hostile parenting behaviors (e.g., interactions marked by anger and yelling). Hostile parent-child interactions are further related to increased adolescent mood problems as well as rule-breaking and aggressive behaviors over time (60; 61). Studies with preschoolers (341) and youth in middle childhood (222) show similar results.

As the poverty rate is significantly higher among African American families, much research has focused on the relationship between economic stress and childrearing in this population. While there is evidence that cultural factors impact parenting practices (176), economic stress offers additional risk for parenting practices that promote child maladjustment. In a study of low-income African American mothers of preschoolers, the most reported parenting style was marked by feeling aggravated with the parenting role and impatience with the child (e.g., likely spank, have lost control of feelings). However, mothers were reportedly able to remain warm toward their children. Importantly, both length of low-income status and maternal negative affect were key risk factors for this parenting style (203). Among a sample of primarily low-income urban African American mothers with an infant, approximately 70% adhered to a rigid parenting style with strict disciplinary techniques, such as hitting and intimidation. In this sample, as economic status decrease, parenting stress significantly increased (39).

In addition to external sources of stress, there is also evidence that the act of parenting can be perceived as stressful. This concept has been entitled “parenting stress,” and covers a range of typical disruptions and irritations related to raising children (68). Parenting stress is related to harsh, negative, and uninvolved parenting styles, as well as inappropriate structure and guidance (12; 79). Parenting stress is further associated with maladaptive outcomes. For example, among preschool-aged children, parenting stress, regardless of parenting behavior, is related to poor social competence, as well as more internalizing (e.g., depressed, anxious, dependent) and externalizing (e.g., bullies others, oppositional) child behaviors while at school (12). Over time, parenting stress predicts less positive maternal affect, less pleasure derived from mother-child interaction, and

more child negativity and problem behaviors (67). Among low-income urban African American women specifically, approximately 16% experienced parenting stress in the clinical range. In this sample, mothers who perceived their own parents as having poor parenting techniques were more likely to report parent stress (39).

Summary

Parenting practices have a significant impact on child adjustment (92). Parental stress, defined as negative affect from a myriad of stressors parents may experience, has an additional negative impact on parental self-efficacy, parenting practices, and child adjustment. This relationship is evident among low-income African American mothers (203). For this reason, behavioral-based family interventions often include a component designed to help parents improve parenting practices, reduce stress, and increase social support. This additional component has been shown to increase the efficacy and reduce attrition of interventions designed to improve parenting skills and child management (305).

PARENTAL SELF-EFFICACY AND OBESITY

Several factors influencing parental self-efficacy have been identified, including prior success or failure in childcare experiences, one's opinion of their own parenting practices compared to those of others, verbal affirmation of parenting practices, and parental stress level (18; 77). Research in other fields indicates that parents of high-risk populations (e.g. attention deficit hyperactivity disorder, autism spectrum disorders) may be particularly vulnerable to low parental self-efficacy, given the unique parenting challenges and stressors specific to these populations (269). Parenting an overweight child may also confer a unique level of stress. Obesity treatment is considered an

individual, rather than a societal responsibility (255), and parents of overweight children are often blamed for their child's weight status (106). In addition, while there is evidence that parents recognize the need to intervene (89), monitoring an overweight child's dietary behaviors is an identified challenge (33), and commonly used intervention strategies (e.g. overly restrictive feeding practices) may actually further promote weight gain (108). Mixed messages parents receive from the health field confounding weight loss practices with the development of eating disorders may further confuse parents in making healthy lifestyle adjustments (255). Indeed, in qualitative studies, parents of overweight children report feeling inadequate in addressing weight-related challenges (89), citing lack of knowledge and fear of promoting disordered eating behaviors as primary barriers to instituting lifestyle changes (33). Similarly, parents of overweight youth report more weight-related problem behaviors (e.g., child eats too much, watches too much television) and less confidence in managing these behaviors (327). In sum, parents of overweight youth may be particularly vulnerable to high stress and low parental self-efficacy in the area of child weight regulation.

TARGETING PRE-SCHOOL-AGED YOUTH FOR PREVENTION

Despite evidence of long-term treatment effects of weight-loss during middle childhood, attenuation of treatment impact is common (96). Therefore, targeting young, preschool aged children may be particularly efficacious in prevention efforts (334). The five-to-seven year age range has been identified as a prime period for the development of overweight (84). As eating patterns established during early childhood often persist into adolescence and adulthood (213), implementing prevention strategies for overweight or obese youth at this critical time period may be beneficial. Accordingly, investigations of

family-based interventions among young children has been recommended as a priority for future research (228).

Prior Studies with Preschoolers

There are currently a limited number of studies investigating weight-related intervention at the preschool level. Generally, data indicate that targeting increased activity and healthy eating behaviors show initial efficacy in weight maintenance, and in some cases, weight loss in youth ages 3-5y (30; 175). Several studies held within academic settings have shown initial efficacy in targeting factors associated with overweight. For example, Dennison and colleagues (82) administered a 39-week program to a racially diverse sample of preschool aged youth, promoting healthy eating and reduced television watching. Similar information was also mailed home to parents. Based on parent report, compared to a control group, youth receiving the intervention watched significantly less television at the post-intervention assessment. While this study did not show a significant difference in BMI between groups at post-intervention, it suggests that variables associated with overweight are modifiable in a preschool population.

Fitzgibbon and colleagues (124) administered a 14-week intervention to primarily African American and Hispanic youth in HeadStart, targeting healthy eating and exercise. Each session included an informational component, as well as a 20-minute exercise period. In addition, parents were sent a weekly mailing summarizing group content and encouraging home involvement. At one and two-year follow-up assessments, children in the intervention group had significantly smaller increases in BMI compared to a control group. There is evidence of treatment effects among underprivileged kindergarten populations, as well (175). Similarly, a program instituted by nurses in a medical setting,

including both parent and child, showed efficacy in prevention and reduction of pediatric overweight, with 20.2% of kids reaching non-obese status at the one-year post-intervention assessment (234).

Only a few studies have targeted parents-only in the treatment and prevention of overweight among young children. Although McGarvey and colleagues did not specifically examine a weight outcome, they found that targeting a sample of primarily low-income Hispanic parents of 2-4 year-olds was effective in increasing parenting behaviors thought to promote healthy lifestyle patterns (e.g., increased activity with child, less consumption of fruit drinks) (202). A home-based intervention teaching parenting and behavioral weight management skills to low-income Native American parents of 9-month-3year-olds was effective in improving parent feeding practices, and trended toward improved child weight-to-height ratio, when compared to a parenting skills-only group (154). Similarly, a home-based intervention for primarily Caucasian, middle to moderate-income parents targeting availability of fruits and vegetables, feeding practices, and modeling of intake was successful in improving child fruit and vegetable intake. Weight change was not measured (150). Notably, Quattrin and colleagues implemented a family-based intervention within a primary care setting with primarily Caucasian families, focusing on improved parenting (e.g., limit setting, time-out) and healthy eating patterns. They observed a significant decrease in parent and child weight at three- and six-months post-intervention, compared to the control group (230).

Summary

These preliminary data hold promise that prevention and treatment of overweight during preschool is feasible, and in light of increasing emphasis on prevention, may in

fact be optimal. As children normally gain weight with age, the prevention model is centered on the idea that, by maintaining weight during growth, excessive weight gain with age can be averted (85). These studies suggest that interventions during this age range are effective in improving eating behaviors and activity patterns related to body weight. A small number have studies have further shown efficacy in pediatric weight loss or obesity prevention.

STUDY RATIONALE: TARGETING PARENTAL SELF-EFFICACY IN THE PREVENTION OF OBESITY IN AFRICAN AMERICANS

Study Rationale

Rates of adult and pediatric obesity are at an all-time high, and even among effective long-term treatments, weight regain is common (96; 331). Given the link between childhood body weight and adult overweight (115), prevention efforts are paramount (85), and there is a clear need for novel approaches in pediatric weight intervention, particularly among racial and ethnic minority groups.

During childhood, self-regulation is an important factor in psychosocial, eating-related, and weight outcomes (92; 141). Child self-regulation is affected by social factors, specifically parenting styles and practices. Parents who feel confident in their parenting abilities, as indicated by higher levels of parental self-efficacy, are more likely to use parenting strategies that promote positive child adjustment. However, perceived parental stress has a negative impact on parental self-efficacy and parenting strategies, and may also provide poor modeling of appropriate self-regulation (174).

Among populations in which parents experience difficulty regulating child behavior, directly targeting parental self-efficacy is an effective treatment strategy (174).

As research indicates that parenting an overweight child confers additional stress (327), parental self-efficacy may be a unique and potentially effective new target for obesity prevention. Given the relative dearth of literature on weight intervention with young children, best practice recommendations increasingly suggest targeting this population in prevention efforts (334). Family-based behavioral intervention among preschool youth has been highlighted as a priority area for future obesity prevention research (228).

Therefore, the research completed was an investigation of the feasibility and acceptability of a group parent-training intervention based on the manual *H.O.U.S.E.* (344) for the prevention of excessive weight gain. As there is preliminary evidence that interventions targeting parents-only are as effective as those involving both parents and children (135), *H.O.U.S.E.* was designed to be delivered in a group modality to parents-only. *H.O.U.S.E.* is derived from social cognitive and behavioral theories (17) and targets parental self-efficacy in family-based change (220). Given the challenges unique to parenting an overweight child (327), *H.O.U.S.E.* first targets parent self-regulation (e.g., stress management, emotion regulation) and parenting skills (e.g., behavior modification), to instill parental confidence, before introducing changes in children's eating and activity patterns. In theory, improving parenting skills and self-regulation as a first step should, in turn, improve parents' ability to manage daily stressors, facilitating parental confidence in making healthy lifestyle changes within the home environment. As a result, parents should have improved likelihood of establishing and maintaining healthy lifestyle changes within the family unit (regular, healthy meals), resulting in effective prevention of excess pediatric weight gain (220).

H.O.U.S.E. was initially designed for parents of obese youth ages 5-8y, and was previously informally piloted in an academic medical center in the southeast United States. Participants were 13 Caucasian (66.67%) and African American (33.33%) obese youth ($M = 29.22 \text{ kg/m}^2$, $SD = 6.69$, 50% female) between the ages of 5-8y ($M = 84.46$ months, $SD = 15.45$) and their guardian(s). Generally speaking, parents involved in this initial run-through of the program seemed to enjoy attending sessions and were able to use the information provided to make positive changes within the home environment (N. Zucker, personal communication, July 10, 2013). The present study was the first formal pilot trial of the intervention. Given the priority of obesity prevention research among young, minority youth (228; 334), African American parents of overweight and obese youth ($\text{BMI} \geq 85^{\text{th}} \text{ percentile}$) ages 2-6 years were targeted.

Implementing Studies with African Americans

African Americans have historically been largely understudied within the research sector. Following the establishment of the NIH Revitalization Act of 1993 (62), which required inclusion of women and minorities in research, increased attention was given to understanding barriers to African American participation in research, and to developing potential solutions to these problems. A review of past literature highlights several relevant barriers to research with minority populations, including mistrust of researchers, lack of clinical trials accessible to minority populations, overly-complicated study procedures, difficulty with transportation and child care, lack of time, poor communication by researchers, and lack of interest in preventative care, among others (93).

To resolve these conflicts, early recommendations included conducting trials within a community sphere and involving community individuals (e.g., pastors, tenant association presidents) in recruiting for research projects. This method has been coined a “community-based” vs. “institution-based” approach to research (31). Indeed, research shows greater success with recruitment and retention of African American subjects when recruitment is “face-to-face” versus over the telephone, and when interventions occur in a community setting, such as a church (132). For the present study, we sought to decrease barriers by holding the trials within a community center easily accessible to most participants, recruiting via community pediatricians and nurses, and providing childcare to facilitate attendance.

SPECIFIC AIMS

This study had one primary aim and two secondary aims. The primary aim was to evaluate the feasibility and acceptability of GPT-O in low-income African American parents of overweight or obese (BMI percentile $\geq 85^{\text{th}}$ for age and sex) children ages 2-6y. The second aim was to examine patterns in the data to determine whether GPT-O is effective in preventing excess weight gain with growth. The final aim was to examine patterns in the data to determine whether GPT-O improves parenting self-efficacy related to child feeding and activity behaviors, and child and parent eating patterns and activity.

Power and Sample Size

This study was designed to assess feasibility and acceptability, not to compare groups. In these cases, a formal size calculation is not required. Rather, it is recommended that the population of interest be well-represented in the chosen sample and that the sample size be adequate to examine the feasibility issues of interest (e.g.,

feasibility of recruitment and intervention implementation), while also considering recruitment challenges and limitations (189; 307). Based on recommendations provided by those with experience with the proposed population, a sample size of 20 was selected. As such, the power for aims two and three were lower than would be desirable. Post-hoc power calculations based on correlations on questionnaire data from baseline to follow-up to detect a moderate effect size, based on a 5% two-sided significance level, were calculated and are provided in the results (Table 2). Despite low power, the proposed analyses for aims two and three were conducted to allow for descriptions of patterns in the data and preliminary estimates of standard deviations and within-subject correlations, to design a full study in the future. The hypotheses and statistical analysis for each aim are provided below.

Hypotheses and Statistical Analyses

Aim 1: To evaluate the feasibility and acceptability of GPT-O in low-income African American parents of children ages 2-6y who are overweight or obese (BMI percentile: $\geq 85^{\text{th}}$ for age and sex).

Hypothesis 1: Participant questionnaire ratings will indicate that the intervention is feasible and acceptable to participants.

The collection of feasibility and acceptability data is considered a critical, first step component to the development of a new behavioral intervention (247). Descriptive analyses were conducted to determine the feasibility and acceptability of GPT-O, by examining the average scores on the feasibility and acceptability questionnaire. To further judge attendance and compliance, a post-group multiple choice questionnaire was also administered to parents, testing their knowledge of skills they were expected to learn

based on the program. Key skills tested included behavior and household management skills, a parent's role at mealtimes, parent stress management, healthy eating skills, and reasons for eating in the absence of hunger.

Measures for Aim 1: Aim 1 examined the primary purpose of this study, feasibility and acceptability of the intervention. Measures for Aim 1 included a feasibility questionnaire and a skills questionnaire. Parents also completed a baseline questionnaire assessing their perception and concern regarding their child's weight.

Aim 2: To examine patterns in the data to determine whether GPT-O is potentially effective in preventing excessive weight gain with age.

Hypothesis 2: Children in the intervention group will show maintenance in weight and body composition, relative to those in the standard of care control group.

To examine weight maintenance in growing children of various ages, the expected BMI change for each intervention and control participant based upon the Center for Disease Control pediatric BMI growth chart data (48) versus the actual change in BMI over the course of six months was calculated. Residualized change scores were created by regressing BMI at the three-month follow-up onto baseline BMI and saving the unstandardized residuals. This method of analysis does not control directly for baseline BMI; it does so indirectly by providing an estimate of pre- to post-group change that is not susceptible to regression to the mean (54). A categorical variable was created grouping children who experienced less than their expected BMI growth versus those whose BMI growth was greater than expected. A binary logistic regression was employed to examine the frequency of less than vs. more than expected BMI growth in the intervention, compared to the standard of care control group. No covariates were used as

children served as their own control. All tests were two-tailed, and differences were considered significant when p values were ≤ 0.05 .

Measures for Hypothesis 2: Hypothesis 2 measured the primary outcome variable of the proposed intervention, child body composition. To assess composition, we examined child BMI change scores in the intervention compared to the standard of care control group.

Aim 3: To examine patterns in the data to determine whether GPT-O improves parenting self-efficacy via improved parenting, stress management, and feeding practices, and, in turn child general, eating-related, and activity behaviors.

Aim 3 is an evaluation of the mechanism of change in the proposed intervention, meaning change in child behavior (general and eating/activity related) via improvement in parental self-efficacy related to improved parenting skills (general and lifestyle-related) and stress management. Given these relationships, we expected to see improvement in overall parenting behaviors, stress management, and feeding practices. We also expected to see improvement in general parental self-efficacy and parental self-efficacy specific to changing their child's eating and activity patterns. In turn, we expected improvements in parenting factors to be related to improved child behavior. These expected changes would support the underlying theoretical model, specifically in a sample of low-SES, urban, African American parents. In a larger study, this hypothesis would be tested using a mediation model to examine whether improvement in self-efficacy would mediate the hypothesized relationship between the intervention and improvement in child eating patterns and activity schedules. However, as this was a feasibility trial with a small sample size, this hypothesis was examined in SPSS using

paired samples *t*-tests. No covariates were examined as participants served as their own controls. Differences were considered significant when *p*-values were ≤ 0.05 .

Hypothesis 3: Self-reported data on parental self-efficacy, stress, and parenting behaviors will be collected prior to and following the intervention. Measures of children's general behavior, eating-related behavior, dietary intake, and activity recall will also be collected. Scores on these measures will show improvement from baseline to follow-up.

Measures for Aim 3:

Parental Self Efficacy: Lifestyle Behavior Checklist, Competence Scale

Toddler Care Questionnaire

Parental Stress: Parent Stress Index-Short Form, Perceived Stress Scale

Parenting Behaviors: Parenting Styles and Dimensions Questionnaire, Child Feeding Questionnaire

Child Behavior: Child Behavior Checklist 1½-5, Child Eating Behaviour Questionnaire, Lifestyle Behavior Checklist, Problem Scale

Child Nutritional Intake/Activity: Block Food Screener for Ages 2-17, Activity Log, Pedometer

CHAPTER 2: RESEARCH DESIGN AND METHODS

OVERVIEW

This was an open-trial feasibility study. The primary outcome was feasibility and acceptability of the intervention. For child BMI expected change only, comparison was made with a standard of care control group. Additionally, parents completed

questionnaires assessing parental stress and self-efficacy, feeding behaviors, and children's eating and activity patterns, to provide a preliminary examination of proposed mechanisms of change.

Participants

Participants were twenty English-speaking African American parent-child dyads. Child participants were boys and girls between the ages of 2-6 years at baseline, whose current body weight for height was $\geq 85^{\text{th}}$ BMI percentile for age and sex. Recruitment was completed at four sites in northwest and southeast Washington, DC: the main Children's National hospital campus (Sheikh Zayed Campus, NW Washington, DC), and three outpatient Children's Health Centers in SE Washington, DC (THEARC, Mississippi Ave. SE, Good Hope Rd., SE, and Martin Luther King Rd., SE). All sites are proximal to each other and serve a primarily low-income African American population. Based on 2007-2011 United States Census 5-Year estimates, median and mean family income in this area are \$38,653 and \$53,138, respectively. Estimated per capita income is \$20,643, and approximately 40.2% of families with children under the age of five years have an income below the poverty level (50).

Child inclusion and exclusion criteria are listed in Table 1. Parents were excluded from participation based on the presence of a DSM-IV-TR psychiatric disorder or a medically-related illness that would hinder adherence to study protocol and participation in weekly meetings. Subject inclusion or exclusion was determined based upon the discretion of the investigators.

Recruitment

Flyers were posted in the main CNMC hospital, as well as in local related satellite offices in the Washington, D.C. metropolitan area. Flyers advertised an 8-week intervention for parents of children with concern about their child's weight (See Appendix A). In addition, Ms. Elliott met with pediatricians and nurse staff at the CNMC satellite offices at the beginning of recruitment, to inform them of the study. In the event that an eligible participant expressed interest in the study, the practitioner referred them to Ms. Elliott, who contacted the parent to complete the screening and baseline assessment, when applicable. All participants were recruited for an eight-week parent-training for overweight prevention program.

Procedures

Prospective participants were screened in person or by phone prior to baseline assessment to assess for inclusion and exclusion criteria, based on parent report (See Appendix B). Participants and children then completed the baseline assessment. Consenting procedures occurred at the beginning of the baseline assessment (See Appendix C). In the event that a grandparent completed the intervention, the child's parent also attended the consenting procedure. Recruitment for each cohort continued until five to eight participants completed the baseline assessment. Three groups were held between April-July 2012. Participants completed a post-group assessment within several weeks of group termination. All physical and psychological assessments and weekly group sessions took place at THEARC Children's Health Center, as it is centrally located and easily accessible via public transportation. Figure 1 shows the study timeline. Attempts were made to complete an official interview with any participant that chose not

to complete the trial during any of the screening or intervention procedures, to assess their reasons for choosing not to complete the study. However, the majority of parents who dropped out of the study were inaccessible following termination.

Baseline Assessment

The baseline assessment determined subject eligibility. Participants were informed of the nature of the project including types of assessment and study procedures. Parents were asked to sign study consent forms before participation. Participants underwent the following procedures:

If not recently collected during a medical visit, child height was measured to the nearest mm, and weight was measured to the nearest 0.1 kg on a digital calibrated scale. Height and weight was used to calculate BMI (Screening, measurement for Aim 2).

To assess for history of psychological disorder, parents were asked if they or their child had received a psychological diagnosis or treatment for a psychological disorder within the past year. Participants reporting current diagnosis or treatment of a psychological disorder requiring an advanced level of care, including a mood disorder, anxiety disorder, eating disorder, substance abuse disorder, schizophrenia, developmental disorder (child), or any other problem preventing completion of the activities of the study, were provided with a list of local (DC area) treatment providers and excluded from participation in the study.

Measurement of children's *Physical Activity* using a Digiwalker™ pedometer was attempted. Parents were instructed in the use of this device during their baseline visit. The assessment was designed for the child to use the device for one weekend day (Saturday) prior to group initiation. The Digiwalker™ has been previously implemented in children

of the preschool age range and has been found to be an accurate measure of physical activity when validated against behavioral observation (204). Parents were directed to place the meter on their child when they first woke up in the morning and to take the meter off when their child went to bed at night. Families were given the pedometer at the baseline visit and told to bring the device to the first treatment meeting. As the intervention was originally designed, parents were to complete this process for the post-group assessment. However, pedometer assessment was not completed due to lack of feasibility, which is addressed in the results and discussion sections (Aim 3).

Parents were asked to complete all questionnaires regarding their own and their child's psychological and social functioning and eating patterns (Aim 3). Copies of all questionnaires are included in Appendix D. Questionnaires included:

The *Lifestyle Behavior Checklist* (327) is a 25-item questionnaire that generates two scales. The Problem Scale assesses the total problem behaviors typical to overweight youth (e.g., eats too much, demands extra helpings at meals, range 25-175). The Confidence Scale measures parents' total perceived confidence in handling children's problem behaviors (range 25-250). *The Lifestyle Behavior Checklist* has demonstrated adequate internal consistency and test-retest reliability and has been validated for use with parents of children ages 4-11y (327). As this is a relatively new measure, it has not been validated for use with a low-income, African American sample.

The *Parenting Stress Index-Short Form* (2) is a 36-item shortened version of the original version of the form (3). It is a self-report measure that identifies areas of stress in the parent-child relationship. Subscales generated include Parental Distress, a measure of parenting stress related to personal factors, such as parenting confidence, marital stress,

and lack of social support, Parent-Child Dysfunctional Interaction, a measure of unmet expectations within the parenting role, Difficult Child, a measure of child behavior that makes a child difficult or easy to manage, and a Total Stress score to provide an overall level of parenting stress. Lower scores indicate less stress. A total raw score >90 is considered clinically significant. This is a reliable and valid tool and has been extensively used (2). This measure has been validated for use with a primarily low-income African American sample (237).

The *Block Food Screener for Ages 2-17 "Last Week" version* is a food frequency questionnaire developed by NutritionQuest/Block Dietary Systems in Berkeley, CA, that asks about children's intake by food group, based on servings eaten of individual portion sizes on the week prior to assessment based on frequency ("How many days last week did you eat or drink it?") and amount ("How much in one day?"). Participants were provided with a general multiple choice option for the latter question (e.g., "1 bowl, 2 bowls, 3 bowls"; "A little, Some, A lot"). A range of food and beverage intakes are assessed, with output data based on the NHANES III data (29). For this intervention, parents completed the questionnaire. Although food frequency questionnaires generally provide an inaccurate estimate of caloric intake and are moderately correlated with actual intake among preschoolers, for the purposes of this experiment, the questionnaire was administered to provide a proxy of dietary intake and habits. The original version of the *Block Food Frequency Questionnaire* is well-validated. As the "last week" screener is a relatively new tool, a validation study with preschool youth has not been conducted. The measure was recently validated with children 10-17y (161).

Child *sedentary activity* was attempted to be measured based on parent report of time spent engaging in activities involving the computer, television, and video games on one weekend day (Saturday).

The *Children's Eating Behaviour Questionnaire* (321) is a 35-item parent-report questionnaire regarding children's eating behaviors. This measure assesses a variety of eating behaviors. For the purpose of this study, those factors associated with obesity proneness, including Food Responsiveness (a measure of desire for food following exposure to attractive food cues), Enjoyment of Food (a measure of enjoyment and interest in food), Emotional Overeating (a measure of eating more in response to negative mood states), Desire to Drink (a measure of request for and frequency of drinking), Satiety Responsiveness (a measure of dietary compensation for food previously consumed), Slowness in Eating (a measure of speed of eating and time taken to complete a meal), and Fussiness (a measure of selectivity about the range of foods that are accepted), were examined. Each scale ranges from 1-5, with higher values representing greater levels of the behavior examined. The *Child Eating Behaviour Questionnaire* has demonstrated good internal validity and test-retest reliability, and has been validated for use with young children (42). An adapted version of this measure has been used previously with low-income African American mothers (227).

The *Child Feeding Questionnaire* (26) is a 5-point Likert-type questionnaire designed to assess parental feeding attitudes and behaviors that are associated with overweight. The *Child Feeding Questionnaire* was administered to provide a baseline assessment of parenting practices related to feeding. For the purposes of this investigation, five subscales (range 1-5) were administered: Perceived Responsibility (a

measure of parental perception of their responsibility for child feeding), Concern about Child Weight (a measure of parental concern about their child's risk of being overweight), Food Restriction (a measure of parental restriction to access of certain foods), Pressure to Eat (a measure of parents' tendency to pressure their children to eat more food), and Monitoring (a measure of the extent to which parents oversee their child's eating). This measure has adequate internal validity (26). An adapted version of this measure has been used previously with low-income African American mothers (227).

The *Perceived Stress Scale* (56) is a 10-item self-report instrument that assesses overall perception of lifestyle stress from the past month on a 5-point Likert scale (range 0-4). The items generate one total sum (range 0-40). A clinical cut-off has not been established, but higher scores represent greater perceived stress. This measure has been validated in an racially and culturally diverse community sample (57).

The *Parenting Styles and Dimensions Questionnaire-Short Form* (240) is a 32-item self-assessment instrument measuring parenting style and behavior on a 5-point Likert scale (range 1-5). Items generate three main scales based on Baumrind's topography (Authoritative, Authoritarian, Permissive), and characteristics related to those parenting styles. This measure is reliable and valid and has been adapted for use with low-income minority parents (64).

The *Toddler Care Questionnaire* (147) is a 37-item Likert-type scale for rating parental self-efficacy in managing a range of tasks and situations relevant to raising young children. A Total Score is generated (range 37-185), and higher scores indicate greater parental self-efficacy (Gross & Rocissano, 1988). This measure was validated in

middle-class caregivers of preschoolers (63) and has shown good reliability in a sample of low-income primarily African American and Hispanic mothers (145).

The *Child Behavior Checklist 1½-5* (4) is a parent-report assessment of child psychopathology. The *Child Behavior Checklist* includes parent report of problem behaviors used to generate an Internalizing Problem Behavior subscale, an Externalizing Problem Behavior subscale, and a Total Problems subscale. T-scores < 60 are considered normative. The *Child Behavior Checklist 1½-5* has been validated in a broad, ethnically and socioculturally diverse sample (4), as well as investigated for use with low-income, African American mothers.

Intervention Description

GPT-O was implemented as an eight-session (90-min each) intervention based on the manual *H.O.U.S.E.* (Humorous, Open-Minded, Undisturbed, Strong, Explicit approach to Parenting). GPT-O was delivered by Ms. Elliott. For two of the three groups, Ms. Elliott was assisted in conducting the groups by another graduate student. GPT-O is administered in three stages. The first stage provides parents with parenting tools, including a general approach to parenting, emotion regulation strategies, behavior modification strategies, and mindfulness strategies aimed to increase parental self-efficacy. The second stage focuses on improving household structure, specifically through modification of mealtimes and bedtimes. Stage three contains content more traditionally associated with behavioral weight management programs, namely, healthy eating, regular exercise, and education about media literacy, with an emphasis on the importance of parental role modeling of healthy lifestyle behaviors. This third component also involves teaching skills to help parents teach their children effective ways to identify

and respond appropriately to hunger cues, to promote eating in response to physiological hunger, rather than other cues (e.g., emotions, smell/sight of food). An example of a healthy snack was prepared and distributed to parent participants at the beginning of each session. At the end of every session, each parent identified a goal for the upcoming week and problem-solved potential barriers and ways to overcome them. Sessions were audiotaped, and supervision was given by Drs. Marian Tanofsky-Kraff and Nancy Zucker.

Pre- and Post-Group Assessments

In addition to the baseline assessment, all group participants attended a follow-up assessment taking place within two weeks of group termination. This assessment was identical to the baseline assessment with the exception that parent/child psychological screening questions were not conducted. Additionally, a questionnaire examining the feasibility, utility, and acceptability of the *H.O.U.S.E.* intervention was administered to all participants. Parents were also able to provide open-ended feedback. In addition, a multiple-choice questionnaire examining knowledge gained from the intervention was administered to further assess feasibility. Copies of all feasibility/acceptability questionnaires are provided in Appendix E.

Standard of Care Control

Due to an obesity prevention initiative at Children's National, during the recruitment and intervention period (January-July, 2012), parents of overweight or obese youth ($BMI \geq 85^{\text{th}}$ percentile for age and sex) seen during well-child visits were given general healthy lifestyle psychoeducation. This discussion included instructing parents to limit children's intake of juice and other sweetened drinks, increase fruit and vegetable

intake, limit TV time, and increase physical activity. BMI data on youth seen in the clinic during the approximate time of study recruitment were pulled from the Children's National Electronic record system, to serve as a control comparison for youth in the research study. Use of electronic medical record data was approved by the IRB at USUHS and Children's National Medical Center. Youth were matched to intervention participants by age, sex, weight, and follow-up time period requirements, such that group means did not differ significantly. Parents of these youth did not receive informed consent and did not complete psychological questionnaires.

CHAPTER 3: Results

PARTICIPANT DEMOGRAPHICS AND BASELINE CHARACTERISTICS

A graphical representation of the recruitment process can be seen in Figure 2. Intervention participants were twenty African American children (70% female) and their primary caregivers. The age of child participants ranged from 2-6 years ($M = 4.10$ y, $SD = 1.48$). Child participants' BMI percentiles ranged from the 87th - >99th percentile for age and sex (BMI, $M = 21.91$ kg/m², $SD = 4.32$; BMI z-score, $M = 2.46$, $SD = .93$), with the majority (80%) of participants falling within the obese range. Caregiver participants included predominately mothers (75%, $n = 15$) and grandmothers (15%, $n = 3$), one father (5%), and one husband-wife dyad (5%). As assessed via informal baseline interview, participants were free from major psychological or medical conditions that would interfere with intervention completion. All parent participants signed informed consent prior to participation. In the event that a grandmother completed the intervention, the child's parent attended the informed consent process and signed the consent form.

Baseline Concern for Child Weight

At baseline, 40% ($n = 8$) of parents perceived their child as “just right,” 55% ($n = 11$) perceived their child as, “overweight,” and 5% ($n = 1$) perceived their child as, “obese.” Forty-five percent of participants ($n = 9$) viewed their child’s weight as a health problem, and 55% ($n = 11$) did not. Seventy percent of parents ($n = 14$) reported a previous attempt to improve their child’s weight, and 30% ($n = 6$) had not. In response to the query, “How much do you worry about your child’s current weight,” 25% of parents ($n = 5$) indicated “no worry,” 40% ($n = 8$) indicated “a slight worry,” and 35% ($n = 7$) reported, “a lot of worry.” When asked about future concern for their child’s weight, 20% ($n = 4$) of parents reported, “no worry,” 25% ($n = 5$) reported, “a slight worry,” and 55% ($n = 11$) reported, “a lot of worry.” Notably, all parents reported feeling that it is “very important” to make sure that their child is at a healthy weight. In terms of awareness, 90% ($n = 18$) of parents reported that their doctor had expressed concern to them regarding their child’s weight, and 85% of parents ($n = 17$) reported that their doctor had further explained future potential health risks associated with pediatric overweight. Seventy percent ($n = 14$) of parents also reported that a family member or friend had expressed concern regarding their child’s weight. Only 25% ($n = 5$) of parents reported that a family member or friend had expressed disapproval or had complicated attempts at healthy lifestyle changes. A graphical representation of the results is presented in Figure 3.

Baseline Parental Self-Efficacy

At baseline, parent confidence on the *Toddler Care Questionnaire* ($M = 153.35$, $SD = 28.34$, range 38-190) was descriptively similar to previously collected from primarily mid-SES Caucasian mothers ($M = 155.5$, $SD = 16.5$) (63), as well as data from

a diverse sample of low-income parents of preschoolers in urban communities ($M = 156.8$, $SD = 13.6$) (145).

At baseline, parent confidence in handling problem behaviors common to parents of overweight children on the *Lifestyle Behavior Checklist* ($M = 202.21$, $SD = 54.94$, range 26-260) fell within the clinical range (<204), but was descriptively higher than data previously reported from parents of overweight and obese Australian children ranging from 4-11y ($M = 167.46$, $SD = 45.12$) (328). This measure has not previously been used with parents of low-income, urban, or African American preschoolers.

Baseline Parent Stress

At baseline, parenting stress on the *Parenting Stress Index-Short Form* was as follows: Parental Distress ($M = 25.95$, $SD = 8.87$; 55th percentile), Parent-Child Dysfunctional Interaction ($M = 16.79$, $SD = 5.05$; 40th percentile), Difficult Child ($M = 25.68$, $SD = 7.12$; 55th percentile), and Total Stress ($M = 68.58$, $SD = 17$). Mean values were all within the average range of reported parental stress. Only one parent reported clinically significant Total Stress (raw score >90) within the parenting role. Parental Distress ($M = 24.67$, $SD = 9.13$) and Difficult Child ($M = 26.61$, $SD = 9.69$) subscale means from data previously collected from low-income African American mothers were similar to means reported in this study. However, Parent-Child Dysfunctional Interaction ($M = 22.22$, $SD = 8.90$) and Total Stress ($M = 73.44$, $SD = 25.56$) subscale means were descriptively higher (237).

At baseline, participant mean total score of lifestyle stress on the *Perceived Stress Scale* ($M = 14.50$, $SD = 7.15$, range 2-28) was slightly lower, but generally descriptively

similar to the most recently published normative data for African American adults ($M = 14.70$, $SD = 7.2$) (55).

Baseline Parenting Behaviors

Baseline characteristics of parent feeding practices on the *Child Feeding Questionnaire* are as follows: Perceived Responsibility ($M = 4.57$, $SD = .41$), Concern about Child Weight ($M = 3.60$, $SD = 1.20$), Restriction ($M = 4.63$, $SD = .52$), Pressure to Eat ($M = 2.94$, $SD = .98$), and Monitoring ($M = 4.12$, $SD = .83$). These scores are descriptively higher than norms reported from the original validation study with parents of five to nine year-old girls (Perceived Responsibility: $M = 3.4$, $SD = .95$, Concern about Child Weight: $M = 2.3$, $SD = 1.15$, Restriction: $M = 4.0$, $SD = .78$, Pressure to Eat: $M = 2.5$, $SD = .95$, Monitoring: $M = 3.6$, $SD = .91$) (26). Scores were descriptively similar compared to a sample of combined overweight and average weight African American children ages 3-5 years (11) on Perceived Responsibility ($M = 4.61$, $SD = .67$), Restriction ($M = 4.31$, $SD = .84$), and Monitoring ($M = 4.27$, $SD = .98$). Concern about Child Weight ($M = 2.06$, $SD = 1.15$) and Pressure to Eat ($M = 3.57$, $SD = .86$) were somewhat higher and lower, respectively, in the sample investigated in this study.

Baseline parenting characteristics on the *Parenting Styles and Dimensions Questionnaire* (range 1-5) indicated that parents were generally Authoritative, based on the *Authoritative Parenting* subscale ($M = 4.12$, $SD = .56$), and the subscales that comprise it, including Connection ($M = 4.53$, $SD = .42$), Regulation ($M = 4.25$, $SD = .65$), and Autonomy Granting ($M = 3.58$, $SD = .89$). However, parents also exhibited some negative parenting practices, as evidenced by the *Authoritarian Parenting* subscale ($M = 1.78$, $SD = .45$), and associated subscales, Physical Coercion ($M = 1.54$,

$SD = .36$), Verbal Hostility ($M = 1.68$, $SD = .58$), Non-Reasoning/Punitive ($M = 2.13$, $SD = .68$), and *Permissive Parenting* subscales ($M = 2.48$, $SD = .92$). These scores are descriptively similar to primarily Caucasian mothers of preschoolers (Authoritative: $M = 4.05$, $SD = .32$, Authoritarian: $M = 2.10$, $SD = .38$, Permissive: $M = 2.08$, $SD = .45$.)

Baseline Characteristics of Child Participants

At baseline, mean parent report on the *Child Behavior Checklist* Internalizing Problems ($M = 53.20$, $SD = 8.92$), Externalizing Problems ($M = 49.25$, $SD = 10.04$), and Total Problems ($M = 51.50$, $SD = 9.51$), were within the normal range. At baseline, two youth had Total Problems within the clinical range (T-score ≥ 65).

For the *Child Eating Behaviour Questionnaire*, baseline characteristics are as follows: Food Responsiveness ($M = 2.77$, $SD = 1.28$), Enjoyment of Food ($M = 3.83$, $SD = .89$), Emotional Overeating ($M = 1.76$, $SD = .93$), Desire to Drink ($M = 3.85$, $SD = .93$), Satiety Responsiveness ($M = 3.23$, $SD = .74$), Slowness in Eating ($M = 2.99$, $SD = .58$), and Fussiness ($M = 3.4$, $SD = .42$). Compared to the normative sample of children younger than nine years, Food Responsiveness ($M = 2.2$, $SD = .8$) and Desire to Drink ($M = 2.8$, $SD = 1.1$) were descriptively higher, and Slowness in Eating ($M = 3.0$, $SD = .8$) Enjoyment of Food ($M = 3.6$, $SD = .8$), Emotional Overeating ($M = 1.9$, $SD = .6$), Satiety Responsiveness ($M = 3.0$, $SD = .7$), and Fussiness ($M = 3.1$, $SD = .9$) were descriptively similar.

At baseline, the *Lifestyles Behavior Checklist* problem behaviors scale ($M = 63.85$, $SD = 29.21$, range 25-175) fell within the clinical range (>50), but was descriptively lower than data previously reported from parents of overweight and obese Australian children ranging from 4-11 ($M = 71.88$, $SD = 21.14$) (328). As noted in

Methods, this measure has not previously been used with parents of low-income, urban, or African American preschoolers.

Variables of interest regarding child daily nutritional intake based on the *Block Food Screener for Ages 2-17, last week* version are as follows: fruit (cup equivalent, $M = 1.55$, $SD = .90$, $.09-3.05$), vegetables (cup equivalent, $M = .52$, $SD = .30$, $.10 - 1.29$), whole grain products (ounces, $M = .62$, $SD = .58$, $.01 - 2.04$), saturated fat ($M = 13.46$, $SD = 7.86$, $4.19-35.88$), and dietary fiber (grams, $M = 10.54$, $SD = 5.93$, $3.44 - 23.72$). The average daily intake of added sugars, defined as sweeteners added to processed and prepared foods such as baked goods and sodas (105), was 6.69 tsp. ($SD = 4.83$) and the average caloric intake from sugary beverages was 37.92 ($SD = 53.21$). Total daily estimated mean caloric intake was 1051.74 ($SD = 509.33$, 493.06-2342.81). Based on the USDA's most conservative recommended daily caloric intake, children in the 2-3y age range need 1000 calories per day (≤ 135 from solid fat/added sugar) and youth in the 4-8y age range need 1200-1400 calories per day (≤ 120 from solid fats/added sugar) (163). Based on the mean age range for this sample ($4.1y \pm 1.48$), the mean total daily caloric intake was descriptively slightly below average, with youth on the higher and lower ends of the range falling above and below the recommended daily caloric intake, respectively.

Collection of child activity and sedentary behaviors was attempted at baseline. However, due either to parents forgetting to administer these measures or child non-adherence, these data were only collected for several participants in the first two cohorts. Accordingly, these measures were discontinued for the third cohort, and planned analyses were not completed.

FOLLOW-UP ANALYSES

Of the twenty parents and children who completed the baseline assessment, fifteen completed the follow-up assessment (See Figure 2). Reasons for attrition included scheduling changes preventing session attendance ($n = 1$) and failure to show with non-response to reminder calls to attend sessions ($n = 4$). Only one parent who dropped out of the program agreed to answer follow-up questions regarding program non-completion. In terms of specific characteristics of participants who dropped out, all drop-outs were biological mothers. Three were the mothers of six year old females; all of these mothers attended no group sessions and were non-responsive to follow-up calls. Another parent was the mother of a two year old boy. She attended one session and was subsequently non-responsive to weekly reminder phone calls to attend group meetings. The final drop-out was the mother of a three year-old female. She attended two sessions and then cited a scheduling conflict as her primary reason for dropping out of the research study.

Qualitatively, the three parents who did not attend any meetings required multiple reminder phone calls the day of the baseline assessment, and two of the three mothers were very late. Notably, although unresponsive to follow-up phone calls, the mother who attended only one session did not have a car and lived farther away from THEARC than did most of the other parents. As a cab would not pick her up at her home, she had to arrange for a ride to weekly meetings, which may have proved too difficult on a weekly basis. Finally, as previously noted, the mother who attended two sessions cited a scheduling conflict as her primary reason for dropping out of research study. Specifically, this mother ran an at-home day care for area families. Attending meetings conflicted with effectively completing her job.

Aim 1

To evaluate the feasibility and acceptability of GPT-O in low-income African American parents of children ages 2-6y who are overweight or obese (BMI percentile: $\geq 85^{\text{th}}$ for age and sex).

Hypothesis and Measures: We anticipated that the intervention would be feasible, as indicated by session attendance and information retained from the intervention, assessed with a post-intervention skills questionnaire. We also expected participants to find the intervention acceptable, as measured by a post-intervention feasibility and acceptability questionnaire.

To provide an assessment of internal validity, Cronbach's alpha was calculated for the Feasibility/Acceptability Questionnaire and for the Skills-Based Questionnaire. On the Feasibility/Acceptability Questionnaire, there was 100% correlation between participant answers on two of the five items. Therefore, Cronbach's alpha was calculated using the remaining three items ($\alpha = .57$). Similarly, on the Skills Questionnaire, there was 100% correlation between participant answers on three of the seven items. Therefore, Cronbach's alpha was calculated using the remaining four items ($\alpha = .40$). Both alpha values were below the acceptable level. However, data suggest that alpha may misrepresent internal validity (264), as it is influenced by the number of items on a scale, with more items linked to greater alpha values (65). As such, given that both scales in the present study had very few items, alpha values presented may not accurately reflect the internal consistency of the measures used.

Feasibility/Acceptability Questionnaire

All participants ($n = 15$) indicated that they liked the program, by rating it as "very acceptable." Similarly, the majority of parents ($n = 13$, 86.7%) found the program to be "very helpful." Two participants (13.3%) found the program to be, "really unhelpful." All participants ($n = 15$) also reported that they would be "very likely" to recommend the intervention to a friend. When assessing the likelihood that the intervention might have a negative impact on parents, the majority of participants ($n = 10$, 66.7%) indicated, "unlikely," 13.3% ($n = 2$) indicated, "a little unlikely," one participant (6.7%) was neutral, and two participants (13.3%) reported that the intervention would be, "a little likely" to have a negative impact on parents. The majority of participants found it to be either "very reasonable" ($n = 9$, 64.3%) or "a little reasonable" ($n = 2$, 14.3%) to attend eight consecutive weekly sessions. One participant was neutral on this matter (7.1%), and two participants (14.3%) found attending the weekly sessions to be, "a little unreasonable."

Skills Questionnaire

The average percent correct on the skills questionnaire was 94.3%. All items (100%) were answered correctly by 73.3% of parents ($n = 11$), six of seven items (85.7%) were answered correctly by 13.3% of parents ($n = 2$), and five of seven (71.4%) items were answered correctly by 13.3% of parents ($n = 2$).

Session Attendance

Session attendance ranged from 0-8 sessions ($M = 4.35$, $SD = 2.70$, median = 5). Excluding those parents who did not attend any sessions ($n = 3$), attendance ranged from 1-8 sessions ($M = 5.12$, $SD = 2.12$). Seventy percent of parents ($n = 14$) attended $\geq 50\%$

of sessions. Specifically, 10% (n = 2) attended one session, 5% (n = 1) attended two sessions, no participants attended only three sessions, 5% (n = 1) attended four sessions, 25% (n = 5) attended five sessions, 20% (n = 4) attended six sessions, 10% (n = 2) attended seven sessions, and 10% (n = 2) attended all eight sessions.

Aim 2

To examine patterns in the data to determine whether GPT-O is potentially effective in preventing excessive weight gain with age.

Hypothesis and Measures: Children in the intervention group will show maintenance in weight and body composition, relative to those in the standard of care control group. BMI maintenance/loss versus gain will be calculated based on expected BMI change from pre- to post-group follow-up period.

As anticipated since youth were matched on age and BMI z-score, no differences were observed between the intervention and standard of care control group on demographic measures including age in months (Intervention: M = 52.51, SD = 14.68, Control: M = 52.05, SD = 13.30, F(1,28) = .01, $p = .93$) and BMI z-score (Intervention: M = 2.58, SD = 1.03, Control: M = 2.52, SD = 1.05, F(1,28) = .02, $p = .87$). Youth were also matched for sex such that both groups were 70% female.

There was no observed difference in the intervention (53.3%, n = 8) versus the standard of care control (53.3%, n = 8), on the number of youth with less than or equal to expected BMI growth (χ^2 (1, n = 30) = .00, $p = 1.0$) following the intervention. Twelve of the fifteen intervention youth who completed the post-group assessment also completed a three-month follow-up assessment. Similarly, there was no observed difference in the intervention (66.7%, n = 8) versus the standard of care control (66.7%, n = 8), on the

number of youth with less than or equal to expected BMI growth ($\chi^2 (1, n = 24) = .00, p = 1.0$) from post-group to three month follow-up assessment. As the majority of the sample were obese, to further explore the effect of the group on child weight, actual (not expected) change in BMI and BMI z-score was also explored post-hoc. Findings generally mirrored results from the planned analysis. From baseline to post-group (intervention: $t(14) = -.67, p = .51$; control: $t(14) = -.58, p = .57$) and from post-group to follow-up (intervention: $t(11) = -.82, p = .43$; control: $t(11) = .14, p = .89$), BMI did not change significantly for either the intervention or control group, and the interaction of group by time was non-significant at post-group ($F(1,25) = .15, p = .70$) and follow-up ($F(1,19) = 3.30, p = .09$). Similarly, from baseline to post-group, BMI z-score did not change significantly for either the intervention ($t(14) = .40, p = .70$) or the control group ($t(14) = .61, p = .55$), and the interaction of group by time was non-significant ($F(1,27) = .004, p = .95$). BMI z-score of the intervention group declined significantly from post-group to 3-month follow-up ($t(11) = 2.80, p = .02$). BMI z-score of the control group did not decrease significantly from post-group to 3-month follow-up ($t(11) = 1.09, p = .30$), although the interaction of group by time did not reach significance ($F(1,21) = 1.11, p = .30$). When examining the intervention group linearly, across baseline, post-group, and 3-month follow-up time points, intervention youth decreased .08 BMI z-score points on average per time period ($p = .03$).

Aim 3

To examine patterns in the data to determine whether GPT-O will potentially improve parenting self-efficacy via improved parenting, stress

management, and feeding practices, and, in turn child general, eating-related, and activity behaviors.

Hypothesis and Measures: Scores on these measures will show improved parental self-efficacy and parenting behaviors, as well as improved child eating and activity patterns, following the intervention.

Means, standard deviations, and effect sizes for all Hypothesis 3 analyses are presented in Table 2. Graphical representations are presented in Figures 4-19. Pearson correlations for all measures from baseline to post-group assessment were calculated to determine analytic power based on a medium effect size (.5). Adequate power was considered $\geq .8$. As anticipated due to the small sample size, most analyses were underpowered, with the exception of the Parenting Stress Index (total score calculated) and the Problem Scale of the Lifestyle Behaviour Checklist. Estimated power for each psychological variable is presented in Table 3.

Measures of Parental Self-Efficacy

Toddler Care Questionnaire: There was a non-significant increase in general parental self-efficacy from baseline to post-intervention ($t(11) = -.40, p = .70$).

Lifestyle Behaviour Checklist Confidence Scale: There was a non-significant increase in parental self-efficacy in handling problem behaviors common to overweight youth from baseline to post-intervention ($t(8) = -1.12, p = .29$).

Measures of Parent Stress

Parenting Stress Index: A non-significant decrease was observed on the Total Score ($t(11) = .38, p = .71$), the Parental Distress ($t(11) = 1.01, p = .33$), and the Difficult Child ($t(11) = 1.19, p = .26$) subscales from baseline to post-intervention. A non-

significant increase was observed on the Parent-Child Dysfunctional Interaction subscale ($t(11) = -.179, p = .10$).

Perceived Stress Scale: Due to administrative error, four participants did not complete this measure post-group, so results must be interpreted with caution. A non-significant decrease was observed on the total score from baseline to post-intervention assessment ($t(9) = .32, p = .76$).

Measures of Parenting Behaviors

Child Feeding Questionnaire: There was a significant decrease in parental Pressure to Eat ($t(13) = 2.53, p = .03$) and Concern Over Weight ($t(13) = 2.26, p = .04$), from baseline to post-intervention assessment. There was a non-significant increase in parental Perceived Responsibility ($t(13) = -.71, p = .49$), Restraint ($t(13) = -.48, p = .64$), and Monitoring ($t(13) = -1.22, p = .24$), from baseline to post-intervention assessment.

Parenting Styles and Dimensions Questionnaire: There was a non-significant decrease in Authoritative Parenting ($t(13) = .84, p = .42$) and the subscales comprising its make-up, including Connection ($t(13) = .54, p = .60$), Regulation ($t(13) = .31, p = .76$), and Autonomy Granting ($t(13) = .93, p = .37$), from baseline to post-group assessment. There was a significant decrease in Authoritarian Parenting ($t(13) = 2.73, p = .02$) from baseline to post-group assessment. Of the subscales that comprise this factor, a significant decrease from baseline to post-group assessment was observed on the Physical Coercion ($t(13) = 2.24, p = .04$) and the Non-Reasoning/Punitive ($t(13) = 3.12, p = .01$) subscales. A non-significant decrease was observed on the Verbal Hostility subscale ($t(13) = 1.45, p = .17$). On the Permissive Parenting scale, a significant decrease was observed from baseline to post-group assessment ($t(13) = 2.42, p = .03$).

Measures of Children's Eating Behaviors

Data relevant to the present study (e.g., fruit/vegetable intake, intake of sugary beverages, etc.), were examined. There was a significant decrease in the average daily total kilocalories consumed from baseline to post-intervention ($t(12) = 2.32, p = .04$). There was a non-significant decrease in the total kilocalories from sugary beverages ($t(12) = 1.73, p = .11$). There was also a trend toward a significant decrease in the estimated sugar (tsp.) consumed from foods with added sugars (e.g., sodas, cakes, cookies, sweetened cereals), ($t(12) = 2.07, p = .06$). Saturated fat decreased non-significantly from baseline to post-intervention ($t(12) = 1.38, p = .19$). However, upon re-examination of this variable, it was evident that one outlier was significantly impacting the result. When the analysis was re-run without the outlier, the decrease in saturated fat became significant ($t(11) = 2.28, p = .04$). Change in fruit ($t(12) = .05, p = .96$) and vegetable ($t(12) = .90, p = .39$) consumption was non-significant from baseline to post-intervention. There was also a non-significant decrease in the consumption of whole grain products ($t(12) = 1.37, p = .20$) and dietary fiber ($t(12) = 1.13, p = .28$) from baseline to post-intervention.

Children's Eating Behaviour Questionnaire: There was a significant decrease in Food Fussiness ($t(13) = 4.59, p = .001$) from baseline to post-intervention. A non-significant increase was observed on Emotional Overeating ($t(13) = -.44, p = .67$). A non-significant decrease was observed on Desire to Drink ($t(13) = 1.64, p = .12$), Satiety Responsiveness ($t(13) = 1.43, p = .18$), Slowness in Eating ($t(13) = .71, p = .49$), and Enjoyment of Food ($t(13) = .18, p = .86$). Change in Food Responsiveness ($t(13) = .00, p = 1.00$) from baseline to follow-up was non-significant.

Measures of Child Problem Behaviors

Lifestyle Behavior Checklist Problem Scale: A significant decrease was observed from baseline to post-intervention assessment ($t(11) = 2.98, p = .01$).

Child Behavior Checklist: There was a trend toward a significant decrease in Total Problem Behaviors from baseline to post-intervention assessment ($t(12) = 2.07, p = .06$). A non-significant decrease was observed on the Internalizing Problem Behaviors ($t(12) = 1.41, p = .18$) and Externalizing Problem Behaviors ($t(12) = 1.48, p = .16$) subscales.

CHAPTER 4: Discussion

With the high rate of obesity observed in the United States (218), obesity prevention, particularly among young children (228) and minority populations has become a research priority. The purpose of this study was to investigate the feasibility and acceptability of a parent-only group-based intervention for the prevention of excessive weight gain in young children. Given the challenges unique to parenting an overweight child (327), the intervention provided parents with traditional behavioral weight loss strategies, while also teaching emotion regulation and parenting skills (e.g. stress reduction, behavior modification, problem-solving), to instill parental confidence in making healthy lifestyle changes. Measures of feasibility and acceptability were administered following the intervention. In addition, prevalence of child weight maintenance from baseline to post-group follow-up was compared to that of a standard of care control group. To provide initial indications of change mechanisms, trends in parent-reported parent and child behavior change from baseline to post-group follow-up were

examined. Participants were healthy overweight and obese ($\geq 85^{\text{th}}$ percentile for age and sex) African American boys and girls between the ages of 2-6 years and their caregivers.

Parent Perception of Child Weight

Before beginning the intervention, parents completed a baseline questionnaire assessing their perception of their child's weight and health. A review of the literature on this topic indicates that parental misperception of childhood overweight is common, and most profound among parents of children ages 2-6 years (230). Although the majority of youth investigated in this study were obese ($\geq 95^{\text{th}}$ percentile for age and sex, $n = 16$), only 5% of parents ($n = 1$) classified their child as "very overweight." However, 55% ($n = 11$) of parents classified their child as "overweight" at the baseline examination, suggesting that the majority of parents (60%) recognized that their child's weight was above average. Only 40% ($n = 8$) of parents misperceived their child's weight as, "just right." These findings indicate that parents in the present study were somewhat more accurate in characterizing their child's overweight status, relevant to a review of this literature, which showed that in the majority of studies, less than 50% of parents were able to identify when their child's weight is a problem. In fact, some studies have found that as few as 6% of parents recognize when their child is overweight or obese (275; 278).

Although a significant portion of this sample categorized their child's weight as "just right," the majority of participants expressed concern about their child's current (80%) and future (75%) health. One possible explanation for these findings is that our sample's improved awareness and concern with intervention is due to selection bias, as these parents self-selected to participate in an obesity prevention intervention.

Alternatively, research cites the importance of practitioner feedback to parents to improve parent awareness of children's future health problems related to weight, with a particular focus on health risks associated with obesity (248). In fact, in a study of primarily African American parents of preschoolers, parents considered their child's pediatrician to be the most valued advisor on their child's weight, and lack of information from the pediatrician regarding child weight was most strongly associated with parent misclassification of child overweight status (157). Notably, in the present study, nearly all participants (90%) reported that their health care provider had discussed their child's weight status and expressed concern regarding their child's current and future health, which may have accounted for increased awareness on the part of these research participants. The majority of participants (70%) also reported attempting to take action to reduce their child's weight, further suggesting that parents may have at least tried to act on their practitioner's feedback. Anecdotally, most parents approached to participate in the study were interested in participation, further indicating that this population of urban, low-SES, African American parents was receptive to intervention offered within a healthcare setting. Together, these data suggest that efforts from health care providers to improve obesity awareness may serve to effectively activate parents who may otherwise be unaware of weight and eating issues in their young children.

Aim 1: Feasibility and Acceptability

Feasibility and Acceptability

Session Attendance

In terms of attendance, of those who attended at least one session (n = 17), 82% (n = 14) attended four or more ($\geq 50\%$) of the sessions. This attendance rate is similar to

other weight-related interventions completed with either families or parents-only (248), suggesting that parent interest for this study was on par with studies previously conducted across various populations and settings.

Only a few studies to date examining weight-loss interventions among African American youth have reported the frequency of session attendance. In a study conducted with African American mothers and daughters in inner city Chicago, attendance was slightly lower than that found in the present study, with 75% of participants attending $\geq 50\%$ of sessions (275). In an intervention study administered to 8-10 year-old African American girls from primarily low to middle income families at their elementary school in the afternoon, attendance rate was slightly higher than this study, with $\geq 50\%$ of sessions attended by 87.5% of participants (278). The fact that the intervention in the latter study was implemented at the girls' elementary school after school hours may explain the slightly higher attendance rate. Notably, in the present study, of those participants who attended at least one group meeting ($n = 17$) only two (12 %) did not complete the follow-up appointment.

Participant attrition in studies conducted in community settings has been a long-standing problem identified in this type of research (288; 340). Compared to previous literature, attrition from baseline to follow-up for the present study is comparable (182; 275). Although attendance and attrition rates were akin to analogous studies, the fact that most parents only attended half of the sessions highlights the need for continued evaluation of issues related to care-seeking and intervention retention among low-income individuals of racial and ethnic minority. As discussed previously, research investigating barriers to minority participation in research highlights a number of factors, including

accessibility, overly-complicated study procedures, transportation and child care, lack of time, poor communication by researchers, and lack of interest in preventative care, among others, that prevent research participation (93). We sought to decrease these barriers by holding the study within a community center easily accessible to most participants, by providing childcare, and by prioritizing communication with participants between group meetings (e.g., multiple reminder phone calls). Of note, although the present study was conducted within the community setting and therefore relatively convenient for most participants, it was not held at a location that participants visited as part of their daily routine, such as a school, church, or daycare, and in which existing peer relationships were present. Attendance may have been improved if the intervention were held within this type of setting, particularly given the salience of social support in community-based research (182).

Notably, the Affordable Care Act (1), passed in 2010, may provide a gateway for improvement of access to preventative health care to underserved populations, such as individuals from low-income communities (183). More specifically, this act has a strong focus on improving and disseminating preventative healthcare, with major sections of the bill targeting preventative care at the individual, industrial, community, state, and national level. Of particular relevance to the population investigated in the present study, required funding for free prevention care is targeted on the individual level. On the community/state level, the Act provides state funding for incentives to individuals on Medicaid who adopt and maintain a healthy lifestyle, for improving community healthcare via affording training of community staff for service delivery, and on the national level, for campaigns targeting public awareness of health issues, among others.

To summarize, this Act proposes multiple ways to fund and target many of the issues previously discussed that are identified barriers to prevention-seeking within the African American community (31; 132). As community-based research continues to develop, it will be important to prioritize understanding and limiting barriers to poor attendance and retention, in order to optimize the validity of research results, as well as improve access to intervention.

Feasibility and Acceptability Questionnaire

Similar to other weight-loss or obesity prevention studies targeting parents (128; 182; 261), in the present study, participants generally reported finding the program to be helpful and likable. Although all participants indicated that they would recommend the program to a friend, two participants (13%) reported that the intervention would be “a little likely” to have a negative impact on other parents. Unfortunately, these parents did not provide more information regarding their answer. One potential explanation for this report is that parents were aware that some individuals within their community would not be receptive to recommendations provided through the intervention, potentially related to changing parenting and feeding styles. Alternatively, these parents may have misunderstood the question, and accordingly, their responses would not reflect their true feelings about the nature of the program.

Skills Questionnaire

Based on the mean percentage correct on the skills questionnaire (94%), parents also retained the majority of the information presented during the eight weekly sessions. Anecdotally, parents reported that the program was effective in, “helping us add in more fruits and vegetables,” “showing me how to delegate and schedule down time,” and

“dealing with (child’s behavior),” among others topics. Indeed, although parent reports of confidence improved insignificantly over the course of the intervention, significant improvements were seen from pre- to post-intervention on measures of child nutritional intake and general- and weight-related behavior, suggesting that parents were effective in implementing family-based change and behavioral management strategies taught during the group program.

Qualitative Impressions, Considerations, and Future Directions

Notably, parents appeared to have different strengths and weaknesses within the various aspects covered in the group program. For example, some parents were less knowledgeable regarding food preparation and nutrition, while other parents had difficulty modeling a healthy lifestyle by setting appropriate limits for taking regularly scheduled daily downtime. A trend was observed, whereby during the “check-in” phase of the meetings, parents were able to offer advice to other parents in the areas in which they considered strengths, and in turn, receive advice to improve areas of weakness. Although no measure of social support was administered, a relationship clearly formed between members of the group, which may have contributed to the acceptability of the intervention and relatively high attendance rate. Indeed, social support has been indicated as a key positive factor in other studies of this nature (182), and it appeared to be an important variable in the process of conducting the present intervention groups, as well.

In summary, based on both the objective measure, namely session attendance, as well as the subjective measures, including the skills-based self-report questionnaire, the feasibility/acceptability questionnaire, and anecdotal observation from the group intervention, the primary hypothesis for the study was supported. Group Parent-Training

for Obesity appears to be well-liked and feasible for lower SES African American parents.

Interventionist Considerations and Impressions

When GPT-O was previously conducted, the characteristics of the study differed from the present study. Notably, in contrast to the present study, parents recruited were of mixed racial and socio-economic status, came from various surrounding counties, and were able to facilitate their own transport to weekly group meetings at the medical center. Further, the director of the clinic, who had a strong presence within the clinic and was familiar with the setting and staff, was implementing the intervention and hence facilitating completion of all aspects of the study protocol. Therefore, one final consideration regarding feasibility and acceptability for the present study involves the characteristics of the research team and their impressions regarding recruitment, assessment, and implementation of this intervention with African American parents within a community research setting. Ms. Elliott conducted all recruitment and assessment procedures and was also the primary leader for all three cohorts. She was assisted by an African American female and male clinical psychology graduate student during cohorts one and two, respectively.

Recruitment initially was a challenge, given instruction from the administrative team at THEARC for Ms. Elliott to wait in an office to be contacted by practitioners with the name and phone number of potential participants. Given slow recruitment with this process, Ms. Elliott suggested that she become more active in the recruitment process, via sitting in the doctors lounge in the clinic and speaking to interested participants during their clinic visit, following referral from their provider. Using this method Ms. Elliott was

able to remind practitioners to refer appropriate patients, which greatly facilitated the referral process for making the initial contact with potential participants. An important lesson learned from this experience was that effective recruitment is a very active process, requiring much time and effort on the part of the research team.

Although most parents expressed interest in the study when speaking to Ms. Elliott during the clinic visit, the baseline assessment process proved difficult, particularly given unpredictable no-shows. Although Ms. Elliott made several reminder phone calls prior to and on the day of the baseline assessment, potential participants often did not show for the baseline assessment, even after confirming the time and date during the reminder phone call. Following this experience, to account for anticipated no-shows, Ms. Elliott often scheduled multiple screenings on the same day, when possible. Notably, as one might expect, potential participants who attended the baseline assessment in a timely manner generally had good attendance during the intervention and attended follow-up assessments. An additional issue during the assessment phase of the project was the volume of questionnaires administered to participants. In planning the project, it seemed important to administer questionnaires assessing potential change mechanisms (e.g., parenting and child factors), and efforts were made to select questionnaires that were validated for use with low-income and/or African American individuals. However, in reality, the volume of questionnaires was often perceived as overwhelming to participants, burdensome due to the time needed to complete them, and a challenge for those with limited reading skill. In future iterations of this project, it will be important to select key questions from various questionnaires, or to select shorter questionnaires, to reduce participant burden and potentially improve the accuracy of data collected.

An additional challenge throughout the recruitment and intervention process revolved around having adequate support within THEARC. To begin, Ms. Elliott's primary point of contact at THEARC was often out of the office and unable to provide guidance and support. Ms. Elliott strove to make relationships with other providers within the research setting, which proved critical to successfully implementing the study. More specifically, cooperation and assistance from staff members at THEARC was essential to having the space necessary for assessment and intervention procedures. Although administrative staff and main medical providers (e.g., physicians and nurse assistants) were very helpful, there were times when Ms. Elliott was limited in that she could not meet with a family for recruitment while completing a screening and follow-up visit concurrently. This experience suggests that in this type of setting, an integrative team approach, with multiple individuals available and willing to complete study procedures, would facilitate study implementation.

Within the intervention part of the process, two important themes emerged. First, when working with this population, great flexibility is required on the part of the interventionist. More specifically, given participant circumstances (e.g., bus running late, had to work an extra shift, etc.), participants were often late to group meetings. To compensate for lateness, Ms. Elliott took the first half-hour of the group meetings to 1) obtain updates from present participants' weeks and 2) demonstrate preparing a healthy snack (versus having it prepared in advance). For the second hour, information from prior sessions was reviewed and new material was introduced. This system facilitated efficient use of session time as well as effective discussion of core aspects of the program. Further, during group meetings, participants occasionally raised issues

relevant to their circumstances (e.g., raising a child in a homeless shelter) or family situations (e.g., grandmother present within the home) that required slight deviation from the material within the *H.O.U.S.E.* manual. Allowing time to discuss these issues seemed important to maintaining rapport with participants. Interventionist clinical skill was required to balance allowing time for discussion of such “real-life” issues and introducing required material from the manual, without alienating or offending participants when the topic needed to shift.

This latter issue relates to the second major reflection from the intervention: the personality and skill set of the research team likely had an impact on recruitment and attrition. As noted, factors critical to rapport building within the clinical setting were also applicable in the clinical research setting. Specifically, during the entire duration of the research study, from recruitment to intervention to follow-up assessments, Ms. Elliott prioritized building rapport with participants, by engaging discussion about personal factors (e.g., recreational interests, job experiences, etc.), validating their experience as parents, and engaging with their children. Ms. Elliott also strove to maintain and express an element of curiosity and interest regarding participants’ current parenting practices, in order to limit the potential for participants’ feeling judged or misunderstood. Notably, there was initial concern regarding the rapport-building process as Ms. Elliott is a Caucasian female from the south, who might potentially be viewed as an “outsider” within the community setting. Based on experience from conducting the study, participants easily overlooked any potential racial and/or socioeconomic barriers, and following establishment of basic rapport, were more interested in having an expert opinion regarding lifestyle and parenting change, versus attaining the opinion of someone

of their own race. For example, even when African American first-year student co-leaders were present during group meetings, participants tended to engage more with Ms. Elliott, who was their primary contact for the study, spent the most time with participants, and was likely viewed as having the most experience with obesity and parenting intervention. Notably, in a recent focus group study investigating ways to adapt group-based interpersonal psychotherapy for African Americans, parents interviewed indicated that they would be more likely to want to work with an individual outside of their community, given confidentiality issues (46).

In summary, qualitative experiences from implementing this project in a community versus academic/research setting resulted in several key conclusions. To begin, having support within the community setting is critical for successfully implementing this type of intervention. Attaining this support requires willingness on the part of the investigator to engage and develop relationships with other providers and staff within the community setting. A similar outlook also seems to be required for successfully recruiting and maintaining participants. Overall, work within the community sphere requires great persistence, patience, flexibility, and commitment.

Aim 2: Child Weight Maintenance

In order to preliminarily examine the main outcome of the intervention, child BMI loss or maintenance was examined from pre- to post-intervention and compared to BMI loss or maintenance for a standard of care control group. We anticipated that more youth in the intervention group would maintain or lose weight, compared to the control group. However, in the present study, no difference was observed between the

intervention and standard of care control groups with respect to child expected or actual BMI maintenance or loss.

Previous intervention research with overweight and obese preschool-aged youth is mixed with most (175; 230), but not all (82), studies finding a significant difference between intervention and control groups from baseline to follow-up visits. Two studies of similar nature to the present study have been conducted. In a primary care-based intervention targeting parents of preschoolers, a significant difference in weight loss was observed between intervention and control groups at three months post-intervention (230). Notably, participants in this study were primarily Caucasian parents and their children from both suburban and urban areas. In a study of similar nature conducted with parents of overweight and obese preschoolers in The Netherlands, intervention youth showed improvement in measures of weight compared to the control group at a four month follow-up visit (32). Similarly, Jouret et al. conducted an intervention with parents and teachers of kindergarten students, focusing on increasing awareness of obesity and health correlates, and encouraging healthy eating and physical activity. Intervention youth in underprivileged areas gained significantly less weight than non-intervention youth. However, in this study, the follow-up period occurred at two years, which is much longer than the follow-up period for the current investigation. Fitzgibbon et al. conducted an intervention within the preschool setting targeting improved nutrition and physical activity with low-income primarily African American overweight and non-overweight preschoolers. Parents received supportive information via mail. Similar to the present study, follow-up data indicated no significant improvement relative to the control group

following the intervention lasting just over three months. However, significant group differences in BMI emerged at 1-year and 2-year follow-up assessments (124).

There are several potential explanations for the lack of between-group results related to child weight outcome for the present study. To begin, the follow-up time point assessed in the study may not have been long enough to adequately detect any significant changes in youths' weight. In support of this notion, only two studies to date, which were both conducted with a population very different from the present study, have observed significant changes within the follow-up period used for this present study (32; 230). Notably, Fitzgibbon and colleagues did not see significant changes in child weight status until the 1-year follow-up, suggesting that more time may be required to realize the effect of an intervention of this nature. Alternatively, while the weight and height data for the intervention youth were primarily assessed in a deliberate and consistent manner by members of the study team, youth in the control group were assessed by medical staff at the various recruitment locations, who may have been less concerned with taking accurate measurements. Consequently, anthropometric measures for the control group may not have been entirely accurate, and hence comparisons between groups may have been inaccurate. Notably, examining obesity prevention during childhood is challenging, as children's BMI is expected to increase with age and may be particularly variable during certain age points, such as adiposity rebound and adolescence (59; 245). Cole and colleagues identify four distinct ways of measuring pediatric adiposity change, namely BMI, BMI z-score, BMI centile, and BMI percentage. The authors highlight that the primary advantage of BMI is that there is minimal variability in assessment across the weight spectrum, while other methods (e.g., BMI z-score, BMI centile), are less sensitive

to change in the highest and lowest parts of the distribution. In other words a change in BMI for obese children, who are at the higher end of the distribution ($\geq 95^{\text{th}}$ percentile for age and sex), would reflect a smaller z-score change than a BMI change for an average weight child, who would not fall at the highest end of the distribution. The authors do highlight, however, the utility of BMI z-score in research, and further note that the advantage of BMI over BMI z-score is minimal (59). Importantly, the authors fail to comment on the utility of BMI z-score as a measure, over other methods, when the majority of youth are obese and not being compared to non-overweight youth, as was the case in the present study. As previously described, the present study examined obesity prevention via expected BMI change for each intervention and control participant based upon the Center for Disease Control pediatric BMI growth chart data (48) versus the actual change in BMI at post-group and three-month follow-up. This method of measuring obesity prevention is improved relative to examining actual change, in that it accounts for expected weight/BMI gain in growing children.

To summarize, there are a number of methods for examining adiposity change in growing children. Few studies have examined the relative benefits of the various methods, and there is a dearth of literature examining the most appropriate method for assessing obesity prevention. For the present study, examining expected vs. actual BMI change may have been limiting, as data were examined categorically (e.g., did/did not maintain) versus continuously, and may not have accurately reflected the small changes made in this sample of very obese youth during the limited follow-up period of the study. Notably, intervention youth exhibited a small, but statistically significant decrease in BMI z-score from post-group to follow-up assessment. Since all youth were in the

highest range of z-score, all youth should have been somewhat equally affected by previously discussed limitations of BMI z-score, and this change may actually reflect prevention efforts. However, more research, with variant populations of wide age ranges, is needed to determine the most clinically useful and statistically valid method of examining adiposity change for obesity prevention during childhood.

A final potential explanation for the lack of between-group findings related to child weight outcome is that the intervention may not have been effective in maintaining participants' weight with growth. However, given the relatively short follow-up period and small sample size, conclusions from the present data are limited. Indeed, given some of the positive changes observed in the intervention group (see Aim 3), the likelihood that significant findings with respect to child BMI maintenance should emerge with a larger sample size and longer follow-up period is promising.

Aim 3:

In order to examine patterns in the data related to proposed mechanisms of action, general and weight-related parent and child behaviors, as well as parent stress and self-efficacy levels, were examined at baseline and follow-up periods. We anticipated improvement on these measures at the follow-up period.

Parent Self-Efficacy and Perceived Stress

At baseline, parents exhibited general parenting confidence levels similar to previously published normative data. However, parents reported clinically low confidence with respect to handling behavior problems common among overweight youth (e.g., "Argues about food," "Demands extra helpings at meals"). These data are particularly interesting, in light of the fact that the majority of parents (70%) also

indicated that they attempted to intervene with respect to their child's weight, yet at baseline still reported clinically significant problems related to managing eating and weight-related behavior. Our findings suggest that the parents investigated in the study felt confident with respect to general parenting abilities, but inadequate with respect to managing the primary "problem behavior" manifested by their child: eating and weight-related issues. These findings are consistent with the literature in this area, which suggests that parents of overweight children may feel uncertain with respect to how to effectively intervene to make positive changes in their child's problematic lifestyle behaviors (33; 41), which theory (18) and research within other fields (269) suggests may put them at risk for low self-efficacy within this particular parenting role. For the parents in the present study, who were predominately aware and concerned regarding their child's weight status, it is possible that previous failed attempts at weight control, as well as a sense of responsibility regarding their child's weight status, may have resulted in lowered self-efficacy with respect to this particular aspect of the parenting role.

In terms of perceived stress, at baseline, parents reported general stress analogous to previously published norms with African American adults. However, reported parenting stress was elevated relative to previously published normative data. Notably, the population investigated in the present study included predominately low-income families, and a number of mothers were currently out of work and actively seeking employment. One mother was living in a shelter during the course of the intervention. The elevated stress within the parenting role evidenced in this study is consistent with a growing body of literature linking financial and employment difficulties with elevated parental stress (341).

As expected, following the intervention, parents showed greater self-efficacy with respect to their general parenting abilities, as well as with managing child behavioral problems specifically related to eating and weight. Notably, parent confidence in managing problematic child weight-related behaviors following the intervention ($M = 234.67$) was well above the clinical cut-off (<204). However, these differences did not reach statistical significance. These findings suggest that the intervention may instill a sense of confidence with respect to general parenting, as well as parenting skills needed for weight management.

Parents reported a non-significant reduction in general and parenting-related stress following the intervention. There are several plausible explanations for this finding. Although the intervention encouraged scheduling regular down time and provided suggestions (e.g., take a relaxing bath, deep breathing) for stress management, this portion of the intervention was brief in nature and focused predominately on emotional regulation and stress-management in the context of parenting. As previously noted, a number of parents involved in the study reported major lifestyle stressors that the intervention did not directly target (e.g., job loss, housing difficulties). Consequently, the intervention likely did not have an impact on these issues that require specific intervention and provision of resources. In other words, this intervention did not target the economic strain that many families likely experienced, and that is clearly tied to parent distress (61). In fact, several parents remarked in an open-ended manner that assistance with job opportunities and housing would have been a beneficial component of the intervention.

With respect to parenting stress, as previously noted, this same body of literature links economic hardship and related perceived distress to conflict and stress within the parenting role (61; 166). As such, the intervention may have been ineffective in improving a primary source of parental distress, thus having no associated impact on parent-child conflict. Alternatively, there is some evidence to suggest that reduction in parental distress temporally follows change in child behavior (81), presumably due to the fact that implementing new parenting practices is a stressful endeavor. Perhaps these parents did feel more confident in enacting learned parenting practices that effectively elicit positive child behavioral change (140), but continued to perceive elevated parenting stress as active behavior change was still occurring during the follow-up assessment period.

Parenting Style and Behavior

It was hypothesized that a pattern of change would be observed among general parenting style and eating-related parenting practices. Indeed, significant changes in the expected direction were observed. At baseline, parents reported a predominately authoritative style (e.g., responsive, comforting, praises positive behavior), with additional characteristics of authoritarian (e.g., physical punishment, yelling) and permissive (e.g., gives in to child, gives punishment with no follow-through) approaches. These data are consistent with previously documented parenting styles of low-income African American parents of young children, which suggest that parents maintain warm and positive parenting, mixed with aspects of authoritarian and permissive parenting (160; 203).

With respect to feeding practices, at baseline, parents' scores were descriptively higher than original normative data (26) across all subscales (Perceived Responsibility, Concern about Child Weight, Restriction, Pressure to Eat, and Monitoring), but descriptively similar to a sample of African American parents of average and overweight children (11). Consistent with their baseline report on the multiple-choice questionnaire regarding child weight perception, on the feeding-related questionnaire, parents reported feeling responsible and concerned regarding their child's weight status. Parents further reported elevated levels of restriction and monitoring relative to the original normative sample, suggesting heightened control over child eating behavior. While parent control of child food intake has been cross-sectionally linked to pediatric overweight (112), longitudinal data are sparse, and it remains unclear whether controlling parenting practices contribute to pediatric overweight, or develop as parental attempts to prevent further child excessive weight gain (315). Notably, at baseline, parents also exhibited elevated Pressure to Eat relative to the normative sample, which is characterized by encouragement to eat all of the food on one's plate during a meal time. One possible explanation for this finding is that these elevations captured parents' pressure to eat healthier foods, such as fruits and vegetables. Alternatively, parents may have been encouraging their children to eat food presented at meal times, in hopes of preventing requests for and intake of unhealthy foods outside of meal times.

As hypothesized, following the intervention, parents maintained general authoritative practices, but decreased significantly with respect to authoritarian and permissive parenting practices. Notably, research has cross-sectionally linked permissive and authoritarian parenting styles to child overweight (315), and one study supported this

relationship longitudinally (239). In theory, authoritative parenting, which is warm and responsive to children's needs within the child feeding context supports the development of self-regulation of food intake, whereas an authoritarian style may foster dependence on external cues of hunger and satiety (e.g., "Clean your plate.") (238). In the present study, aspects of authoritative parenting were a key focus of the intervention in terms of general parenting (e.g., maintain a schedule, consistency with discipline, firm but supportive), as well as with feeding (e.g., present choices, encourage and praise trying new, healthier foods). These findings suggest that instruction in authoritative management of children's general and eating-related behavior, as well as implementation of behavior management techniques, may have successfully reduced use of authoritarian and permissive parenting styles.

In terms of parenting practices related to feeding, following the intervention, a significant decrease was observed on the Pressure to Eat and Concern about Child Weight subscales. All remaining subscales (Perceived Responsibility, Monitoring, Restriction), remained unchanged. Given the relatively high scores on these latter scales reported at baseline, it is not surprising that there were no changes following the intervention phase of the present study, as the intervention targeted parents, hence focusing on their responsibility in effecting change, monitoring children's eating behaviors, and limiting children's access to high fat, high sugar foods. With respect to Pressure to Eat, this change is in the expected direction, and suggests that parents were able to implement a key message from the intervention, which involved using an authoritative feeding style, by providing children with a variety of healthy foods and allowing them to select their choices, within reason (223). It was unexpected that parents

would report lower scores on the Concern about Child Weight scale following the intervention. However, parents reported greater confidence with respect to handling children's weight-related problem behaviors, albeit non-significantly, and improved general parenting practices following the intervention. It is possible that this significant decrease on the Concern about Child Weight scale provides further support that parents felt more self-efficacious, and therefore less concerned, with making changes related to their child's lifestyle, following the intervention.

Child Behavior

At baseline, children's mean general problem behavior was within the normative range. This was not unexpected, as youth were screened for emotional and behavioral problems at the baseline assessment. However, anecdotally, parents reported a number of common non-clinical child behavioral problems at the beginning of the intervention, such as talking disrespectfully to parents, arguing when the parent attempts to set a limit, and throwing temper tantrums, among others. In terms of problems common to overweight youth (e.g., "Argues about food," "Demands extra helpings at meals"), at baseline, mean parental report of children's problems was within the clinically significant range. Notably, child behavior data mirror baseline parental self-efficacy data, in which parents had scores similar to normative data with respect to general parenting (as children similarly had general problem behaviors within normal limits), but exhibited clinically low self-confidence with respect to issues specific to parenting an overweight child (as children similarly had significant problems related to eating and weight issues).

Following the intervention, as expected, a trend toward decreased total child general problem behaviors was observed. In addition, also as hypothesized, child problem

behaviors specific to issues related to eating and weight declined significantly, to a level below the clinical range (< 50). These findings generally suggest that behavioral management techniques taught during the intervention were successful in helping parents alter their parenting behaviors in a manner that facilitated improvement in both overall and weight-related child problem behaviors. These data are consistent with a long-standing literature suggesting that behavioral parent training is effective in improving general, as well as weight-related behavioral problems (140).

With respect to child eating behavior, at baseline, children's scores on a measure of eating behaviors were elevated relative to the normative sample on the Desire to Drink subscale, which assesses children's requests for and frequency of drinking, and on the Food Responsiveness subscale, which assesses eating in response to external food cues (e.g., "If able, my child would always have food in his/her mouth") and eating in the absence of hunger (e.g., "Even if my child is full up, he/she finds room for their favorite food"). All other subscales (Emotional Overeating, Enjoyment of Food, Satiety Responsiveness, Slowness of Eating, and Food Fussiness) were similar to the original normative data.

The elevation on Food Responsiveness is in line with a growing body of literature linking eating in the absence of hunger and in response to external cues (e.g., sight, smell of food) to pediatric overweight and obesity (109; 120). Data suggest that while very young children are able to self-regulate their energy intake, as they mature, their eating behaviors become increasingly susceptible to environmental influences (243; 294). In theory, youth who are most susceptible to environmental influences, such as increased portion sizes and easy access to the high fat, high calorie-dense foods seen over the past

several decades (211; 212) may be more prone to overeating and subsequent weight gain (119). Indeed, while all children consume more when presented with larger portion sizes (119; 122; 243), there is evidence that overweight youth are more likely to eat in response to environmental cues (43) and consume significantly more than non-overweight youth *ad libitum* (110).

Similarly, Desire to Drink has been cross-sectionally associated with adiposity in prior studies (155; 325), although the mechanisms behind this relationship remain unclear. Potential suggested mechanisms include increased thirst secondary to heightened salt intake, or alternatively, greater enjoyment of sweetened beverages (325). Irrespective of the mechanism, the relationship between intake of sugar sweetened beverages and obesity across the age span is well-recognized (198), and highlights the importance of this factor in intervention efforts.

Following the intervention, we expected to see a reduction on subscales associated with overeating or eating difficulties, including Food Responsiveness, Emotional Overeating, Enjoyment of Food, and Food Fussiness, and an increase in subscales associated with regulation, including Satiety Responsiveness and Slowness of Eating. The only significant finding was on the Food Fussiness scale, which decreased significantly following the intervention. A non-significant decrease was observed on the Desire to Drink subscale, which was in the expected direction. However, a non-significant decrease was also observed on the Satiety Responsiveness and Slowness of Eating subscales, which was not in the expected direction. Enjoyment of Food and Food Responsiveness were unchanged from baseline to post-intervention.

Historically, Food Fussiness, which measures child resistance to trying new foods and eating a limited variety of foods, has traditionally been associated with under-eating (321), but there is evidence for a relationship with obesity both cross-sectionally (69) and prospectively (5). Agras and colleagues propose that, in response to tantrums related to food, some parents may feed their children to reduce fussiness, rather than using alternative behavioral strategies, hence contributing to weight gain over time (5). Anecdotally, in the sample investigated in the present study, multiple parents commented that their children were eager to eat foods rich in carbohydrate and fat, but would complain when given healthier options, such as fruits or vegetables, or refuse to eat certain foods during meal times. Parents reported child behavioral problems (e.g., arguing, refusal) when encouraging healthier options. Notably, during the intervention, parents were instructed on authoritative parenting practices and behavioral management skills to encourage children's acceptance of new, healthy foods. Techniques taught are thought to be reflective of an authoritative parenting style in the context of feeding, and involved modeling eating healthy foods and praising kids for tasting new foods, rather than forcing children to eat healthier options. As previously discussed, following the intervention, parents reported using significantly less pressure to eat, which has been associated with children's picky eating (315). In this context, the decrease in child food fussiness post-intervention may represent the positive impact of improved parenting strategies (less pressure to eat, more modeling) on children's eating behaviors.

On the Desire to Drink subscale, a non-significant decrease was observed post-intervention. A number of parents remarked at the beginning of the intervention that their child asked for drinks often throughout the day. Parents were encouraged to use

behavioral management strategies (e.g., active ignoring, clear establishment of rules), to decrease this unwanted behavior. Again, it is anticipated that the decrease in Desire to Drink may reflect effective implementation of parenting strategies.

There were not however, any significant findings on other child eating subscales, including Food Responsiveness, Emotional Overeating, Enjoyment of Food, Satiety Responsiveness, and Slowness of Eating. There is a strong genetic foundation for these traits (252), as well as evidence to suggest stability over time (119). Extant literature documents increased prevalence of these factors among overweight and obese youth as young as three years of age, which is thought to put youth at risk for continued weight gain within an obesogenic environment (43; 69). Although genetic underpinnings seem to drive these traits, environmental components are thought to also be at play, and much research has focused on the relationship between pediatric eating behaviors and parental “controlling” feeding practices.

In theory, controlling children’s intake, via restriction of children’s intake and pressure to eat, results in decreased child self-regulation of intake. However, as previously discussed, much of this support is cross-sectional and mixed, lending no clarification to the directionality of these relationships (315), and further suggesting that our understanding of the impact of parent feeding practices on obesity-prone appetitive traits remains questionable. Indeed, the issue of parental restriction offers a quandary: In an environment rich with high-calorie foods, is it advisable for a parent of an overweight child to *not* limit their child’s intake of unhealthy food options, particularly with children who exhibit eating behaviors thought to promote obesity? Sud and colleagues suggest that parenting style may moderate this relationship, whereby restrictive feeding practices

used in the context of an emotionally nurturing home environment, reflective of an authoritative parenting style, may be associated with positive outcomes for child eating behavior. In contrast, restrictive practices accompanied by a cold, authoritarian style may lead to disinhibition (287). While no studies to date have examined parents as agents of change with children's eating regulation, interventions targeting parent modeling have shown positive impact on children's nutritional intake (23; 225; 309), and there is some evidence to suggest that preschoolers can be taught to improve regulation of their hunger and satiety (25; 173). Unfortunately, due to either the small sample size investigated in the present study, the limited follow-up period, or alternatively lack of true change, no statistically significant changes on primary measures of obesogenic eating traits (e.g., Food Responsiveness, Slowness in Eating) were observed from baseline to post-intervention. This highlights the need for future research further examining response of these traits to intervention, as well as potential ways parents can be effectively targeted in intervention efforts.

Child Dietary Intake

Our results indicated that at baseline children's total dietary intake was under the normative amount for children in early childhood. This finding is not surprising. Although food frequency questionnaires are meant to serve as a proxy of normative patterns of food intake (137; 260), data suggest that mothers are more likely to underestimate, versus overestimate, their child's dietary intake (260; 294). Further, research examining report of intake with adults (171; 194) and children assisted by their parents (51; 121) indicates that overweight and obese individuals are more likely to underreport their intake compared to non-overweight individuals. As the majority of

youth in the intervention were obese, it seems likely that baseline data represent underreporting by parents, either due to difficulty with recall, or to the social implications of having an obese child.

Therefore, data from the present study will be interpreted with caution. Intake of healthy foods, including fruits, vegetables, and fiber did not change significantly from baseline to post-intervention. Prior studies of this nature with preschoolers have been mixed, with some (150), but not all (124) studies finding an effect of the intervention on healthy food intake. Notably, in the present study, total dietary intake did decline significantly, suggesting some positive change in overall dietary patterns. Notably, children's saturated fat intake reduced significantly from baseline to post-intervention, and trends were observed on overall intake of added sugar and sugary beverages, suggesting that children's intake of high calorie, low nutrient-rich foods and drinks declined over the course of the intervention.

Intake of sugar and sugar-sweetened beverages has risen in recent years, particularly among low SES youth of ethnic and racial minority (87; 318). Research in this area has primarily focused on the contribution of added sugars through consumption of sugary beverages, such as soft drinks, sports drinks, punch, and juice. As previously discussed, an association between intake of sugar sweetened beverages and obesity across the age span is well-recognized (198) and has been specifically linked to weight gain and obesity risk among preschool-aged children prospectively (88; 193). Notably, a review of the literature found that intake of sugar-sweetened beverages is the one dietary factor that has been consistently linked to child BMI prospectively (208). Further, there is evidence to suggest that targeting intake of sugar sweetened beverages is an effective obesity

prevention strategy in school-aged children (167). In summary, findings from the present study suggest that low-income, African American parents can effectively modify their child's intake of unhealthy foods that contribute to intake of sugar and saturated fat. Further data are needed to investigate the impact of reducing intake from sugar sweetened beverages among preschool-aged youth on weight outcome with age.

Summary: Evaluation of the Proposed Model

Although the sample size for the present study was inadequate to examine a mediational model, results may provide a preliminary assessment of the proposed model driving the parenting intervention investigated in the present study. According to the underlying theoretical model, parental self-efficacy was targeted in family-based behavioral change, via improved parenting skills and stress management. Parental changes were anticipated to positively impact child general and eating-related behaviors, and in turn, improve children's lifestyles. As anticipated, parents reported significantly improved parenting practices following the intervention, as well as improved child behavior. Improvement in child weight-related problem behaviors was both statistically and clinically significant. In addition, child eating behavior improved significantly with respect to overall caloric intake, intake of sugar and sugar-sweetened beverages, and level of parent-reported fussiness while eating. Notably, following the intervention, parents were more self-efficacious in terms of both general and weight/eating-related parenting, although this finding did not reach statistical significance. Parents also reported less general stress following the intervention, although this finding was also non-significant. These overall findings are consistent with prior research that has supported targeting parental self-efficacy as a first step in effecting overall child behavioral change (174).

However, we did not see any significant changes related to child weight when compared to a standard-of-care control group. Notably, the present study did not assess long-term child weight outcome, which may have prevented observation of an effect.

Importantly, this is the first known study of this type to specifically examine parental self-efficacy with respect to managing pediatric overweight among African American families in a community setting. In terms of feasibility and acceptability, session attendance was adequate, and parents reported enjoying the program and finding it helpful. Although the analyses were predominantly underpowered, these findings provide preliminary evidence to suggest partial effectiveness of the intervention with respect to parent self-efficacy, as well as targeted parent and child behaviors. Educating parents with key knowledge specific to weight management, accompanied by components of behavioral parent training, may effectively increase parent confidence in making and sustaining healthy changes, thus positively impacting their child's lifestyle.

Potential Limitations

As the present investigation was a feasibility study, the primary limitation was the relatively small sample size. To adequately explore mechanisms of change and child weight outcome, a larger sample size is required to achieve adequate power. Nevertheless, collecting feasibility data is a required initial step in developing and assessing the utility of a novel intervention (247), as well as determining effect sizes upon which to base the sample size for an adequately powered trial. In the present study, Type I error was set to 5%. Across all comparisons, it is anticipated that the overall Type I error would be greater than 5%. However, given that the results were generally in the expected direction across psychological indices, it can somewhat be concluded with

confidence that significant findings observed were an effect of the intervention, rather than of error. As the intervention proved feasible and acceptable to participants, and also potentially had positive changes on mechanisms thought to improve child weight trajectory, our data provide initial evidence that a larger trial examining the efficacy of the intervention on obesity prevention is warranted.

An additional limitation was that all elements of the study procedure, including administration of assessment questionnaires and implementation of the group program, were completed by Ms. Elliott. Therefore, participants' responses to assessment questionnaires may have been affected by their relationship with Ms. Elliott.

A third limitation was the methodology employed for the control group. Since the control group was derived from electronic medical record data from Children's National Medical Center, there was no control comparison on psychological and behavioral assessments, thus limiting the implications of our findings. Further, the weights and heights of children in the control group were collected somewhat differently compared to youth in the intervention group. As previously described, weights and heights of intervention youth were primarily collected by members of the study team, using multiple measures for both height and weight, with equipment at THEARC. Anthropometric data for youth in the control group were collected by nurses at the clinics from which participants were recruited, during healthy and sick-child visits. Notably, during these visits, nurses take height and weight measurements quickly and only once, which may have resulted in less than accurate assessment.

An additional methodological limitation was our lack of follow-up period. As previously noted, the primary outcome of the present study was feasibility, and therefore

a long follow-up period was not included in the study design. Although some significant changes were observed with respect to parent and child behaviors, the impact on child weight was inconclusive. Previous studies of this nature are limited, and within the small literature, mixed with some, but not all studies evidencing a positive effect of the intervention studied on child weight outcome at the post-intervention assessment. Therefore, lack of follow-up data limit the ability to make any initial conclusions regarding the effect of this intervention on the main outcome variable: child BMI maintenance.

A fifth potential limitation is the proposed sample demographic. As participants were recruited from an urban, underprivileged, predominately African American area, acceptability and feasibility of the proposed study may not generalize to individuals of other race/ethnicity or social classes. However, while the proposed sample will not be representative of the US demographic as a whole, underprivileged and minority populations show a disproportionate risk for obesity relative to Caucasian individuals (125; 317). Further, this demographic is understudied, in terms of obesity prevention and intervention, and is thus in dire need of research developing novel and effective interventions. Therefore, an African American, low-SES population was specifically selected for study in the present investigation, with the hope that results may better inform future development of treatment interventions among this underserved and very important population.

A final limitation was the lack of assessment of parent BMI and socio-demographic data. Since the main aim of the present study was feasibility, and small sample size prevented examination of mediational and moderating factors, specifics of

parent BMI, SES, work status, relationship status, and age were not collected. While these factors were discussed during group meetings, they were not systematically collected during the baseline assessment. Notably, the area from which participants were recruited is a predominately low-income urban area. However, there was likely some variability with respect to parent age, income, and relationship status that may have impacted factors specifically targeted during the intervention, such as parent stress and child eating behaviors. Further, as the goal of the intervention is to effect family-based change, it would be expected that parents would also maintain or lose weight. Given the well-known correlation between children and parents' BMI, as well as links between parent weight loss and child weight loss (338), examining these relationships would be important for future evaluation of the intervention investigated in the present study.

Future Directions

Suggested Modifications to G-PTO

As one of the primary purposes of a feasibility study is to determine the feasibility of the intervention itself, there are several potential modifications that should be discussed.

To begin, in the comments section of the feasibility and acceptability form, several parents commented that they would have preferred that the intervention include more sessions. Indeed, although all of the intervention content was discussed within the eight-week intervention period, termination seemed rather abrupt. During the three-month follow-up, parents often provided Ms. Elliott with a general update of progress, or asked follow-up questions related to challenges that presented following the intervention period. Based on parent feedback, as well as experience gleaned from this pilot trial, it

could potentially be beneficial to include 3-4 individual meetings following the group intervention, perhaps every other month, to continue reiterating the primary points of the group program, and to provide parents with support as they are continuing to make household changes. Indeed, there is some evidence to suggest that adding maintenance sessions improves treatment outcome (330). Additionally, during a full-scale trial, maintenance visits might offer the additional benefit of improving follow-up visit attrition rates.

An additional potential area for improvement would be to involve, “real time” parent-training in the intervention. Although parents were generally attentive during group meetings and reported trying different parenting skills and feeding practices within the home environment, Ms. Elliott had a chance to observe parents interact with their children in the waiting room before and after the group meetings. Parents occasionally used parenting or feeding strategies that were inconsistent with the approach taught during the intervention (e.g., giving a child multiple servings of a food for a snack). To keep study methodology consistent, Ms. Elliott did not interfere with parenting practices during these, “free” periods. However, one area for future development could be to include an unstructured time where parents and children interact, during which the interventionist is available to intervene and instruct parents on a “real time” basis, to further reiterate session content and provide parents with supervised time to implement strategies taught during the group sessions. A potential intervention technique to be employed would be an adapted version of Parent-Child Interaction Therapy, which was originally designed for use with children with behavior problems. Consistent with the *H.O.U.S.E.* model, Parent-Child Interaction Therapy incorporates building and

maintenance of a positive parent-child relationship, with concurrent implementation of behavioral parent training (231).

General Considerations for Future Research

Given the increasing emphasis on obesity prevention, an important emergent area is prevention during the earliest points of development: gestation and infancy. As previously noted, there is a clear link between maternal excessive gestational weight gain and child obesity risk (20; 254) that is thought to be the result of intrauterine metabolic programming (7; 47). While much more research is needed to uncover the mechanisms that confer later obesity risk, targeting prevention of excess weight gain during pregnancy and early infancy has been cited as one way to reduce obesity risk at the earliest stage of development. In discussing potential intervention points, Wojcicki and colleagues specifically suggest incorporating discussions about appropriate gestational weight gain into medical appointments, and maternal psychoeducation as solid foods are introduced during infancy (335).

In preventing excess maternal gestational weight gain, a number of studies have targeted dietary and activity patterns, with an early review of the literature generally indicating a significant positive effect of such interventions (281). Further support from later studies includes a positive impact when intervening with both non-overweight and obese women (14; 336). However, not all of the interventions included in the review were controlled, and some randomized controlled studies have not evidenced a positive impact of lifestyle intervention on gestational weight gain (149; 181). Notably, one study that did not show an impact of the intervention on weight did evidence improvement in maternal eating patterns (149). Additional longitudinal research is needed to determine if

excess maternal gestational weight gain prevention is effective in impacting child weight trajectory into childhood, adolescence, and adulthood. Research is further needed to clarify the extent to which maternal diet influences the risk for excess weight gain, and whether improving maternal diet, independent of gestational weight gain, may improve later child obesity risk.

A number of studies have also been designed to target obesity risk factors during infancy. For example, Paul and colleagues intervened during infancy by teaching parents how to discriminate and respond appropriately to hunger versus non-hunger related infant fussiness and/or how to effectively introduce solid foods. Parents receiving both types of intervention had infants with lower weight-for-length percentiles at a one-year follow-up compared to infants of parents receiving only one type of behavioral intervention (224). In a similar vein, a number of studies are on-going, targeting appropriate infant feeding behaviors in tandem with important issues such as parenting habits and appropriate sleep schedules, in primary obesity prevention (40; 74; 302).

Concluding Remarks

In summary, the present study investigated the feasibility and acceptability of a group-based parent training intervention for the prevention of obesity among parents of otherwise healthy overweight and obese African American children ages 2-6 years. Hypotheses were generally supported in that the intervention was both feasible and acceptable to parents. Further, preliminary examination of change mechanisms suggests that key intervention targets (e.g., parenting style, feeding practices) improved following the intervention, with changes on several measures reaching significance. However, conclusive results are limited due to the planned small sample size of the present study.

These findings suggest that further investigation of the intervention, employing a randomized controlled trial methodology, is warranted.

Table 1: Child Participant Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Age 2-6y	Parent or physician reported weight-related health co-morbidity in child
BMI Percentile $\geq 85^{\text{th}}$	Evidence of major psychiatric or medical illness
Good physical health other than overweight	Current participation in weight-loss program
African American	
DC resident or willing to travel	

Table 2: Descriptive Statistics for Baseline and Post-Intervention Parent Report Measures

Measure	Baseline M (SD)	Post- Intervention	p- value	Effect Size
Measures of Parental Self-Efficacy				
<i>Toddler Care Questionnaire:</i> Total Score	146.5 (33.48)	151.25 (32.47)	.70	.11
<i>Lifestyle Behaviour Questionnaire:</i> Confidence Scale	210.08 (56.90)	234.67 (24.22)	.29	.37
Measures of Parent Stress				
<i>Perceived Stress Scale:</i> Total Score	15.50 (7.10)	14.70 (8.91)	.76	.10
<i>Parenting Stress Index</i>				
Parental Distress	24.83 (8.17)	22.92 (3.92)	.33	.29
Parent-Child Dysfunctional Interaction	16.50 (4.78)	19.08 (8.16)	.10	.52
Difficult Child	26.42 (8.40)	25.00 (8.35)	.26	.34
Total Score	68.00 (18.34)	67.00 (18.27)	.71	.11
Measures of Parenting Behaviors				
<i>Parenting Styles and Dimensions Questionnaire</i>				
Authoritative	4.06 (.49)	3.91 (.67)	.42	.23
Connection	4.43 (.42)	4.36 (.51)	.60	.14
Regulation	4.21 (.85)	4.14 (.85)	.76	.08
Autonomy Granting	3.53 (.87)	3.29 (1.05)	.37	.24
Authoritarian	1.74 (.44)	1.50 (.37)	.02	.73

Physical Coercion	1.54 (.37)	1.34 (.25)	.04	.61
Verbal Hostility	1.52 (.49)	1.35 (.23)	.17	.39
Non-Reasoning/Punitive	2.18 (.65)	1.80 (.71)	.01	.83
Permissive	2.63 (1.02)	2.14 (.86)	.03	.65
<i>Child Feeding Questionnaire</i>				
Perceived Responsibility	4.55 (.43)	4.67 (.39)	.49	.19
Concern for Child Weight	3.67 (1.15)	3.0 (1.37)	.04	.61
Restriction	4.69 (.50)	4.75 (.40)	.64	.12
Pressure to Eat	2.95 (1.13)	2.25 (.89)	.03	.68
Monitoring	4.07 (.76)	4.37 (.82)	.24	.33
Measures of Child Behaviors				
<i>Child Eating Behaviour Questionnaire</i>				
Food Responsiveness	2.73 (1.29)	2.73 (1.35)	1.0	.00
Emotional Overeating	1.61 (.72)	1.75 (.94)	.67	.12
Enjoyment of Food	3.79 (.87)	3.75 (.71)	.86	.05
Desire to Drink	3.76 (.89)	3.29 (.91)	.12	.44
Satiety Responsiveness	3.33 (.73)	3.03 (.38)	.18	.38
Slowness of Eating	3.05 (.51)	2.91 (.64)	.49	.19
Food Fussiness	3.50 (.44)	3.13 (.45)	.001	1.23
<i>Lifestyle Behaviour Checklist</i>				
Problem Scale	62.00 (29.24)	47.08 (19.94)	.01	.86
<i>Child Behavior Checklist</i>				

Internalizing Problems	53.46 (8.01)	49.85 (10.20)	.18	.39
Externalizing Problems	50.08 (11.42)	46.31 (9.57)	.16	.41
Total Problems	52.00 (10.26)	48.23 (8.29)	.06	.57

Measure of Child Daily Dietary Intake

<i>Block Food Frequency</i>				
<i>Questionnaire</i>				
Fruit (cup)	1.45 (.94)	1.43 (.96)	.96	.02
Vegetables (cup)	.50 (.32)	.41 (.22)	.39	.26
Whole Grains (oz.)	.59 (.64)	.36 (.26)	.20	.38
Dietary Fiber	10.32 (6.71)	8.19 (5.45)	.28	.31
Sugar Added (tsp.)	5.50 (3.82)	3.38 (2.74)	.06	.57
Saturated Fat*	11.80 (6.40)	7.80 (3.30)	.04	.66
Sugary Beverage (kilocal)	31.84 (49.67)	6.64 (10.02)	.11	.48
Total Energy Intake (kilocal)	967.62 (417.13)	688.17 (329.79)	.04	.64

*Values removing outlier

Table 3: Estimated Power for Psychological Variables

Measure	Pearson's Correlation	Estimated Power (%)
<i>Toddler Care Questionnaire</i> : Total Score	.22	30
<i>Parenting Stress Index-Short Form</i> : Total Score	.88	94
<i>Perceived Stress Scale</i> : Total Score	.45	38
<i>Lifestyle Behaviour Checklist</i>		
Confidence Scale	-.18	19
Problem Scale	.82	82
<i>Child Behavior Checklist</i> : Total Problems	.58	49
<i>Child Feeding Questionnaire</i>		
Perceived Responsibility	-.15	20
Concern Over Child Weight	.63	49
Restraint	.39	35
Pressure to Eat	.50	41
Monitoring	.34	33
<i>Parenting Styles and Dimensions Questionnaire</i>		
Authoritative	.47	39
Authoritarian	.68	.60
Permissive	.69	.60
<i>Child Eating Behaviour Questionnaire</i>		
Food Responsiveness	.66	.55
Emotional Overeating	-.09	21
Enjoyment of Food	.60	49

Desire to Drink	.28	31
Satiety Responsiveness	.09	25
Slowness in Eating	.16	27
Food Fussiness	.77	72
<i>Block Food Frequency Screener for Ages 2-17: Last Week</i>		
Fruit	.36	33
Vegetables	.00	23
Whole Grains	.35	33
Saturated Fat	.26	29
Dietary Fiber	.39	35
Sugars Added	.41	35
Sugary Beverages (cal)	-.21	20
Daily Caloric Intake	.34	33

Figure 1: Study Design

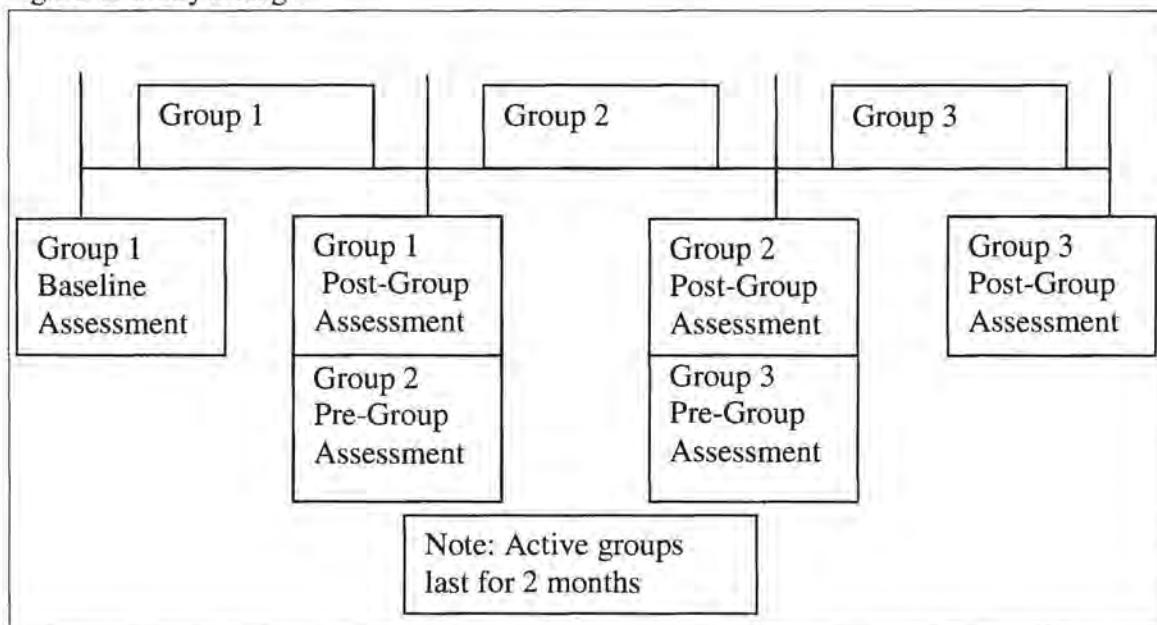


Figure 2: Recruitment and Attrition

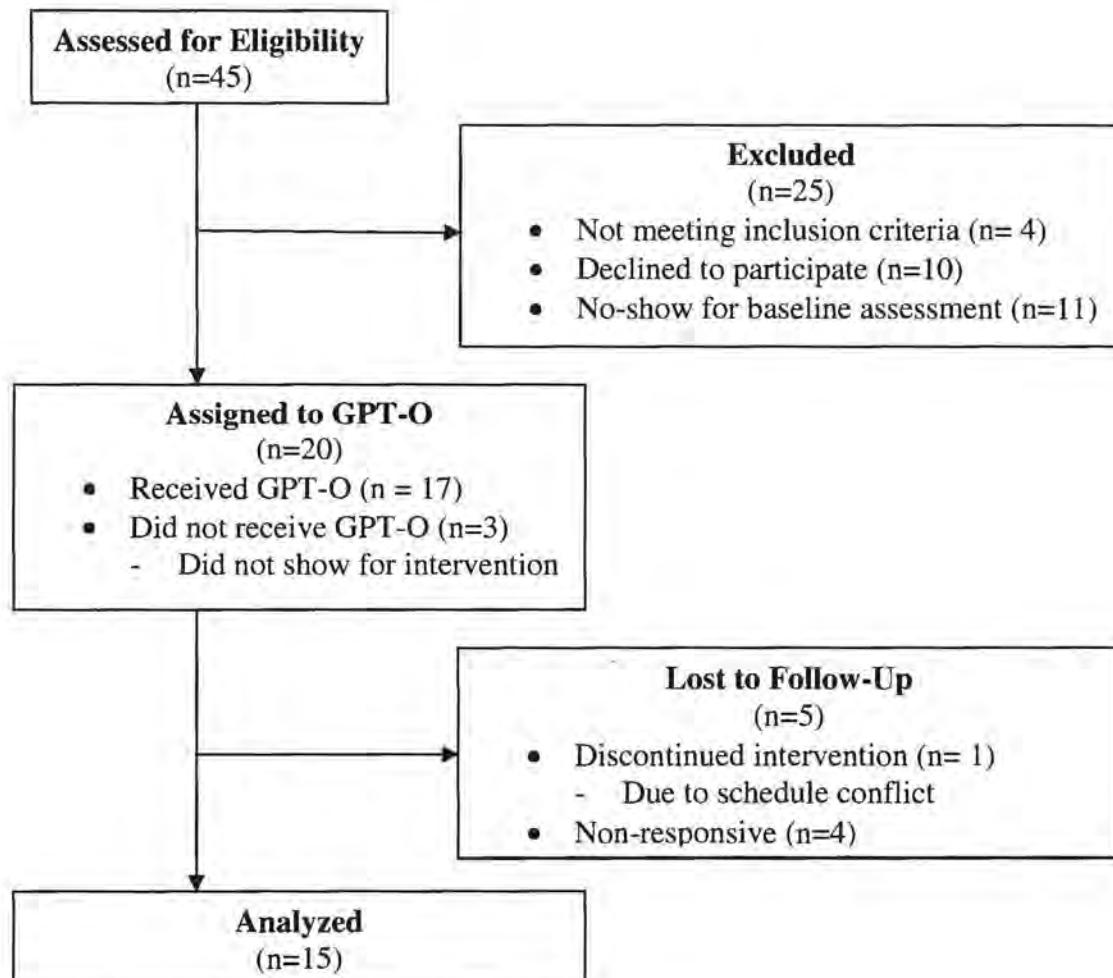


Figure 3: Health Assessment Questionnaire

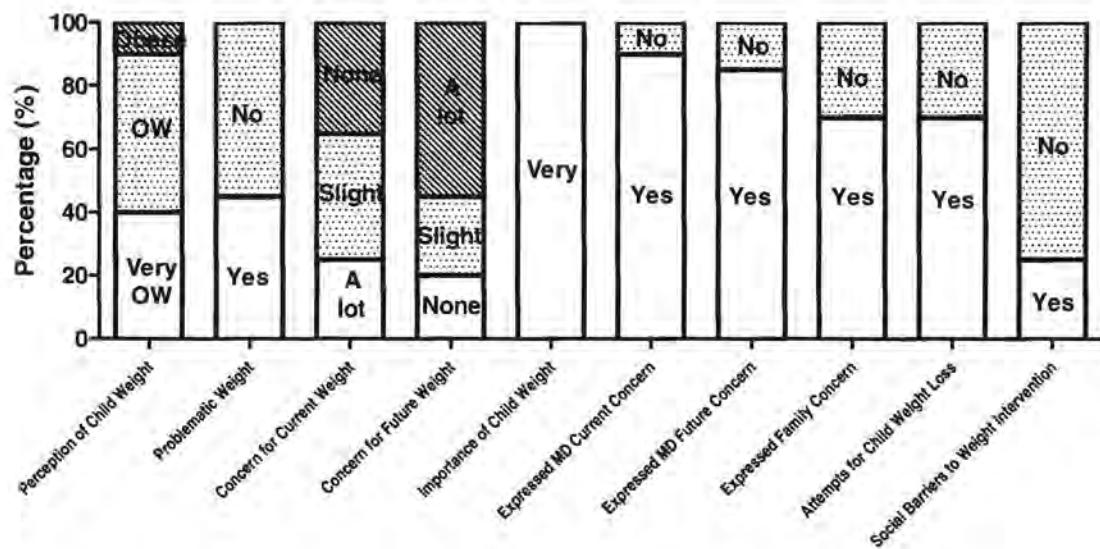


Figure 4: Toddler Care Questionnaire

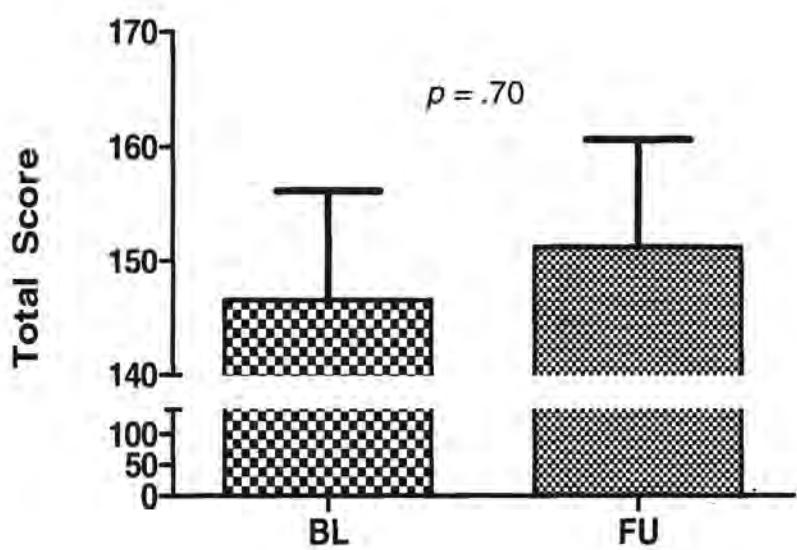


Figure 5: Lifestyle Behavior Checklist: Confidence Scale

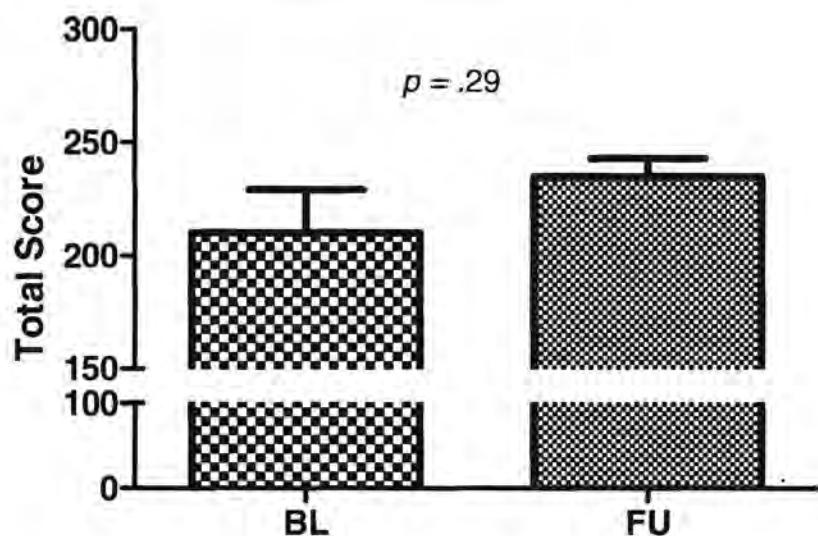


Figure 6: Perceived Stress Scale

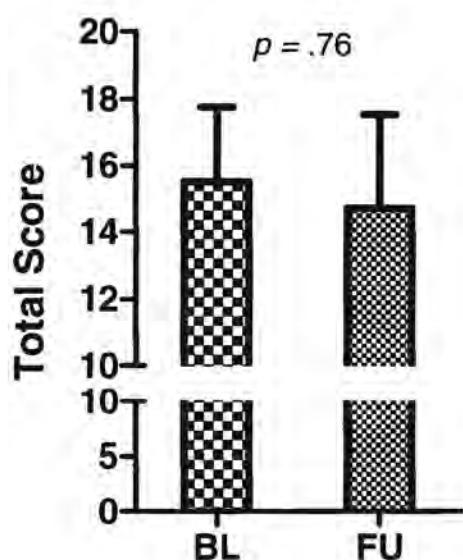


Figure 7: Parenting Stress Index-Short Form

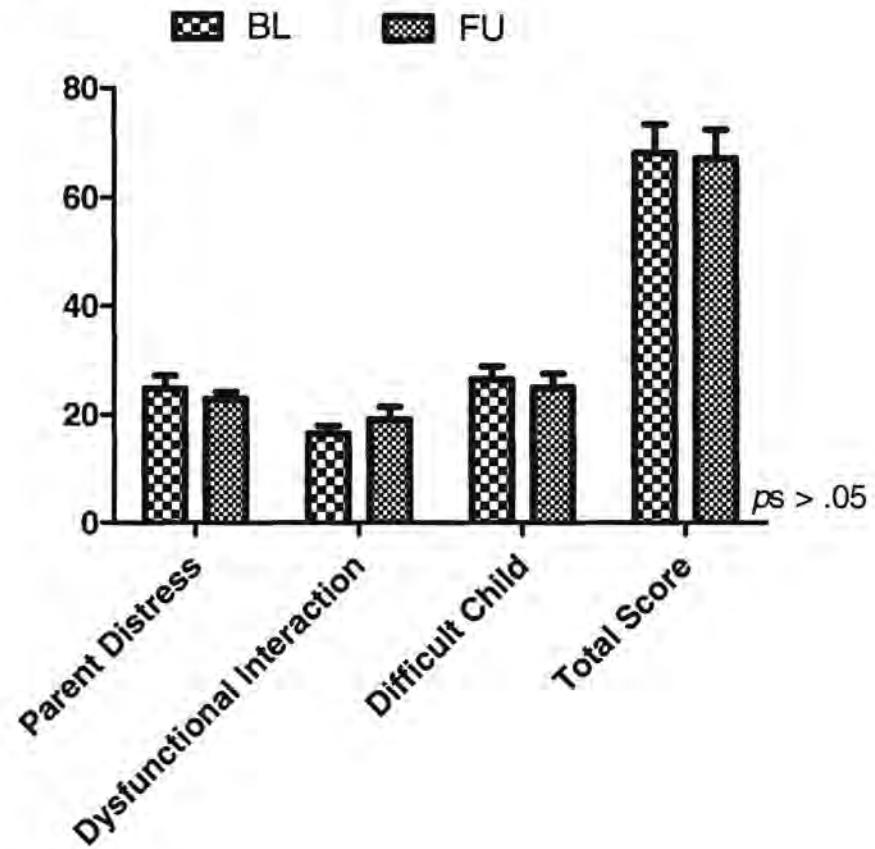


Figure 8: Child Feeding Questionnaire

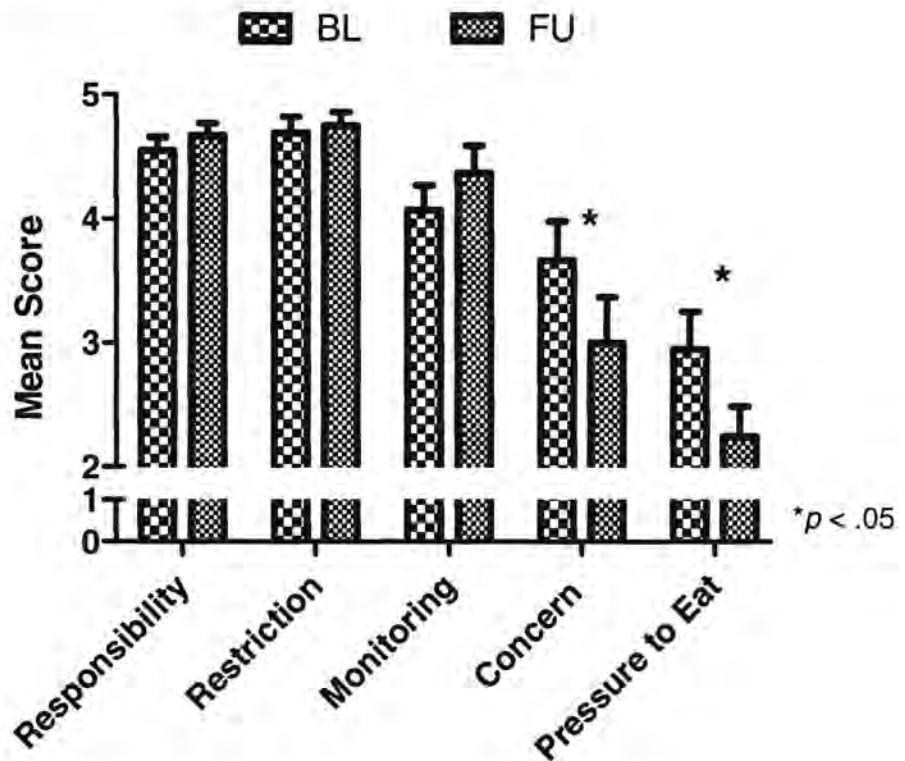


Figure 9: Parenting Styles and Dimensions Questionnaire

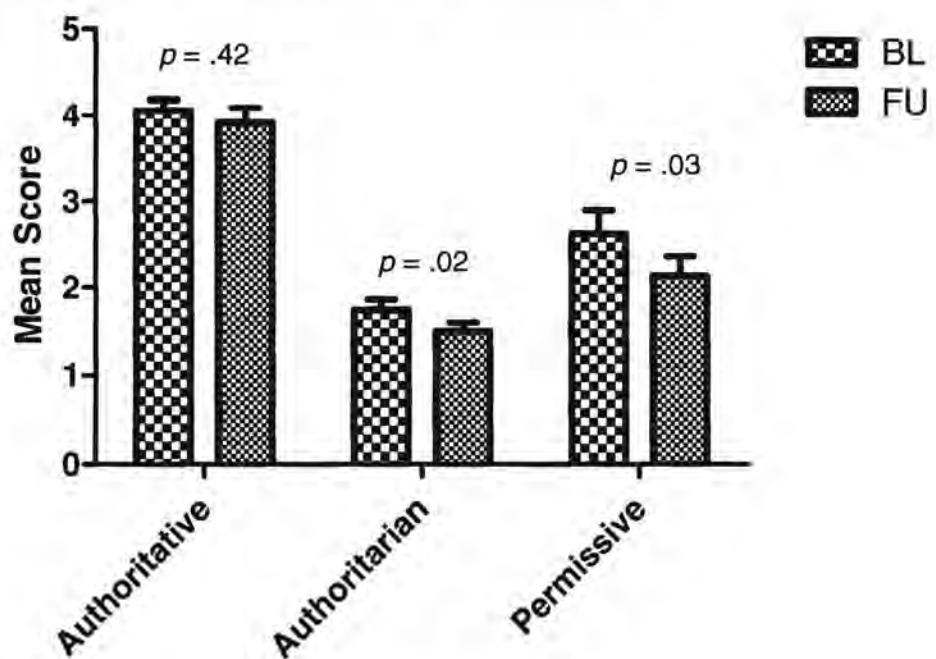


Figure 10: Lifestyle Behaviour Checklist: Problem Scale

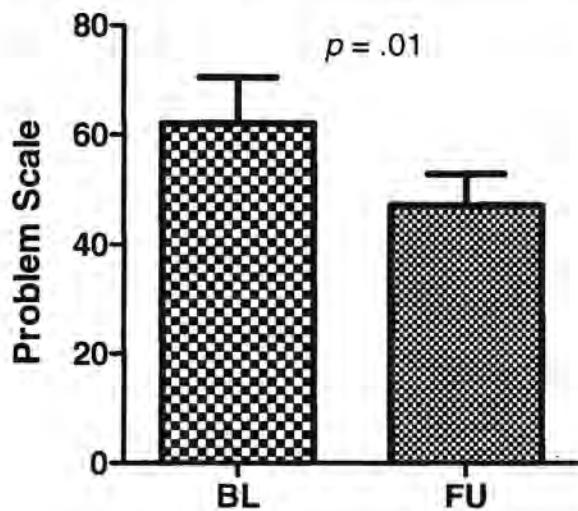


Figure 11: Child Behavior Checklist 1½-5

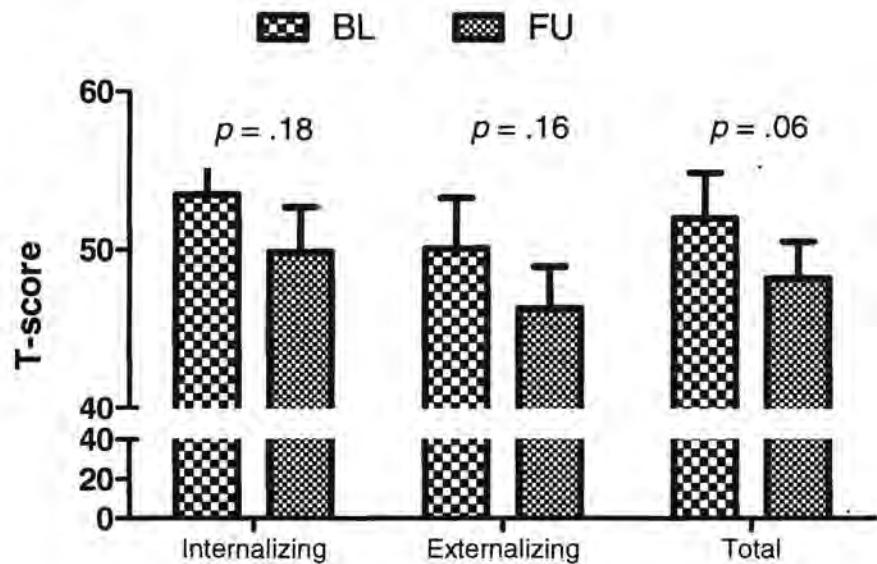


Figure 12: Child Eating Behaviour Questionnaire

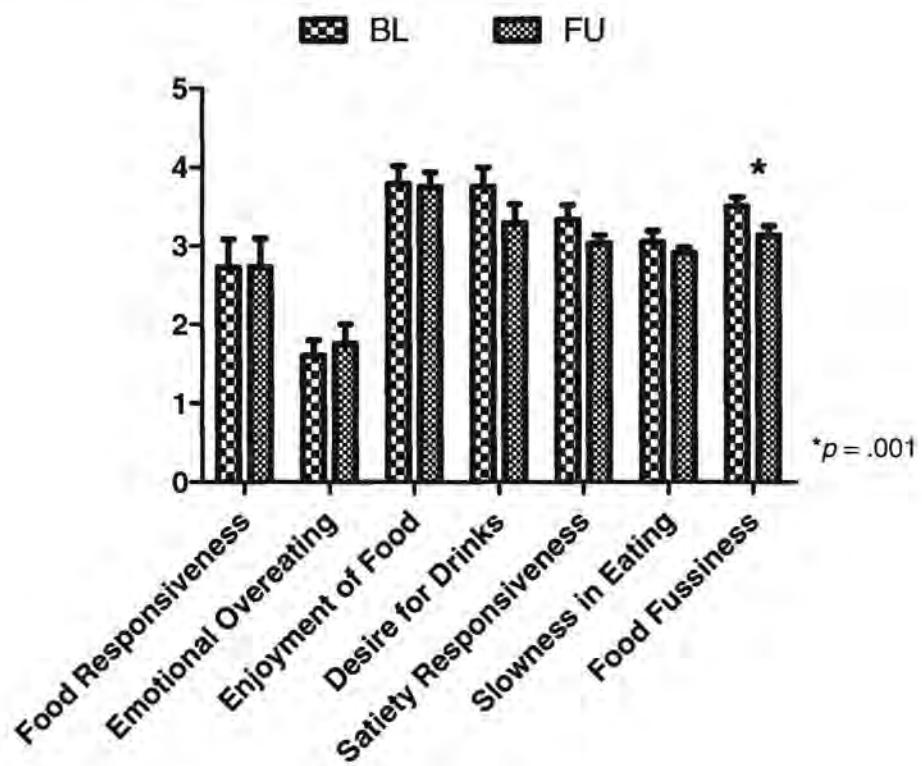


Figure 13: Fruit and vegetable intake

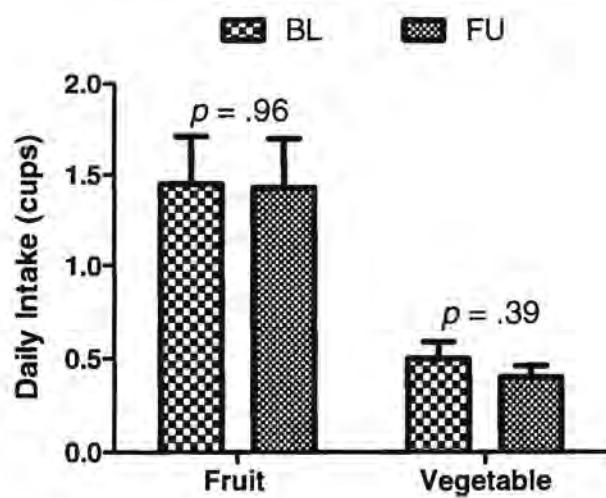


Figure 14: Fiber intake

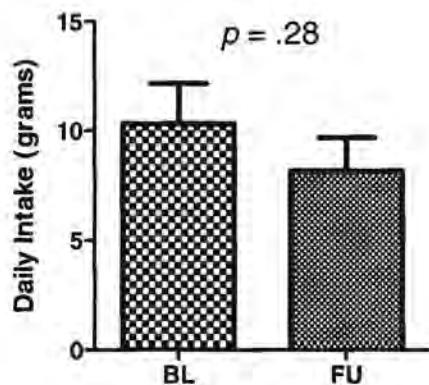


Figure 15: Whole Grain intake

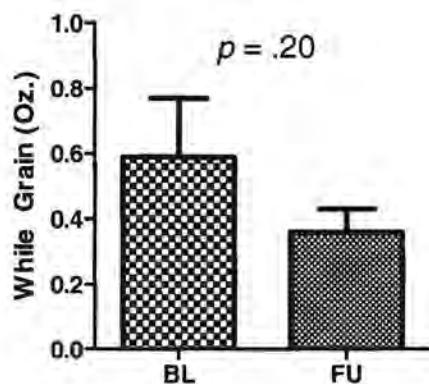


Figure 16: Added sugars intake

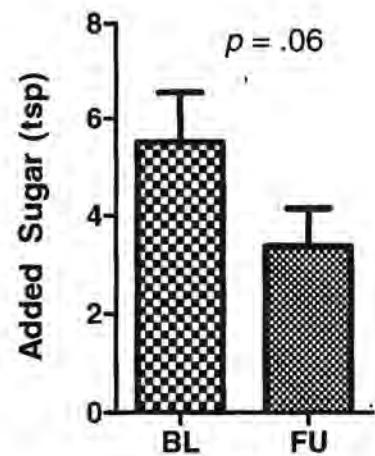


Figure 17: Sugary drinks intake

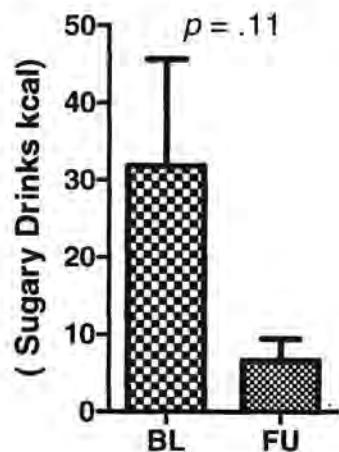


Figure 18: Saturated fats intake

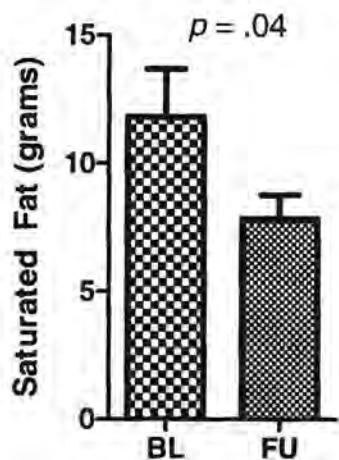
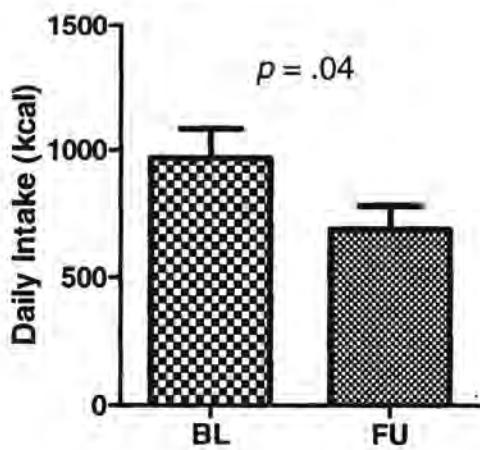


Figure 19: Estimated daily intake



Appendix

APPENDIX A: SCREEN

Screen Information Sheet

1. Parent's name: _____
Child's name: _____
2. Child's date of birth: _____
3. Child's age: _____
4. Child's reported height: _____ Child's reported weight: _____
Child's Estimated CDC BMI %ile: _____

If Child Qualifies based on age and BMI %ile:

5. If you or your child has any Medical Problems, please describe them: _____
6. Have you or your child been diagnosed or received treatment for any emotional problems? Specify: mood disorder, anxiety disorder, eating disorder, substance abuse disorder, schizophrenia, developmental disorder (child), other: _____
7. If you or your child are currently taking any Medications, please list them: _____
8. Dietary restrictions? Y N
Explain: _____
9. Involvement in psychotherapy or weight loss program? Y N
10. Did your child lose more than 5 lb. in the past 3 months? Y N

Please complete the following:

How did you hear about the study _____
Able to attend weekly 1½-hour sessions for eight weeks? Y N
If not explain: _____

Parent's Home Address: _____
Homephone# : _____
Workphone# : _____
Cellphone# : _____
Email: _____
Best method to contact: _____ Best time of day: _____
Physician's Name: _____
Physician's Address: _____
Physician's phone #: _____
Emergency contact: _____
Phone: _____

PARENTS OF YOUNG CHILDREN

Concerned about your child's weight?

Interested in learning how to improve your child's life-style?

Consider doing a research study!

What: An eight-week group for parents to learn how to decrease their stress and reduce their child's risk for future obesity.

Who: African-American parents with a child between the ages of 2-6 who is overweight.

Where: Children's Health Center at THEARC
1901 Mississippi Ave. SE
Washington, DC 20020

Children's National researchers are learning more about preventing children from becoming obese as adults. We are focusing on developing a new approach.



Participants will be compensated.

***For more information, please contact
Camden Elliott at 301-295-2397.***



Children's National
Medical Center



www.

APPENDIX C: CONSENT

Study ID:Pro00001877 Date Approved: 3/29/2012 Expiration Date: 11/6/2012

CHILDREN'S NATIONAL MEDICAL CENTER

Department of General and Community Pediatrics
111 Michigan Avenue, NW
Washington, DC 20010
(202) 476-5000

CONSENT TO PARTICIPATE IN A CLINICAL RESEARCH STUDY AND AUTHORIZATION TO USE PROTECTED HEALTH INFORMATION

TITLE OF STUDY:	Group Parent-Training for the Prevention of Pediatric Obesity (G-PTO)
PRINCIPAL INVESTIGATOR:	Nazrat Mirza, MD, ScD, Department General and Community Pediatrics

INTRODUCTION: We would like to invite you to be part of a research study at Children's National Medical Center. Before you decide if you would like to participate, we want you to know why we are doing the study. We also want you to know about any risks (anything unexpected that might happen) and what you will be expected to do in the study.

This form gives you information about the study. Your doctor will talk to you about the study and answer any questions you have. We encourage you to discuss this study with your family and anyone else you trust before making your decision. We will ask you to sign this form to show that you understand the study. We will give you a copy of this form to keep. It is important that you know:

- You do not have to join the study.
- You may change your mind and stop being in the study any time you want.
- If we make any important changes to the study we will tell you about it and make sure you still want to be in the study.

A. PURPOSE OF STUDY

This study is looking at a new program, Group Parent-Training for the Prevention of Pediatric Obesity (G-PTO), that teaches parents how to help their child develop a healthy lifestyle, so they will be less likely to be obese as they get older. You and your child are eligible for this study, because, due to your child's weight, your child is more likely to be obese as an adult. This also means that your child is more likely to develop health or emotional problems as they get older, such as heart problems, type 2 diabetes (sugar diabetes), or low self-esteem. Since we want to keep children as healthy as possible, our goal is to prevent them from being obese as an adult. As a parent, you are very important in helping your child make healthy choices.

Page 1 of 10

The group program includes a weekly meeting for eight weeks. The main reason we are doing this study is to find out if parents like this program and find it helpful. We will ask you questions about the program, about your parenting behaviors, and about your child's eating and activity habits, both before and after the group program. There will be around 20 parents with a child between the ages of 2 and 6 who will take part in this study. Since African American children are especially likely to become overweight, we are only including African American parents and children in this study.

Your child must be overweight based on a body mass index (BMI, which looks at height and weight), percentile greater than the 85th percentile for their age and sex. Your child will not be able to do this study if he/she is not healthy, is taking a medication that might affect his/her body weight, or is attending weight-loss treatment. You will not be included if you have a medical illness that would keep you from attending and participating in group meetings, or an emotional illness requiring an advanced level of care.

B. PROCEDURE

There are three main parts to this study, all of which will take place at THEARC (Town Hall Education Arts and Recreation Campus):

1. *Screening and Pre-Group Meetings:* The first part of the study is a screening and pre-group meeting that will take between one and two hours. During this meeting, we will find out if you and your child are able to take part in the study. This meeting includes:
 - a. **Measurements.** We will measure your child's height and weight.
 - b. **Questionnaires.** We will ask you to answer questions about your own and your child's emotional and physical health, your parenting behaviors, and your child's eating behaviors. We are asking these questions to make sure that you and your child are able to take part in the study and would not be better served with more advanced care. You may choose to not answer any question that makes you feel uncomfortable. If there is concern that you or your child has a major emotional problem, including a mood disorder, anxiety disorder, eating disorder, substance abuse disorder, schizophrenia, developmental disorder (child), or any other problem preventing you from completing the activities of the study, you will not be able to participate in the group. In this case, we will give you a list of local care providers who treat emotional or behavioral problems and make sure you understand how to contact them for treatment. All of your answers will be kept confidential. This means that only members of the study team will see your answers, unless we are worried that your health or your child's health is at risk.
 - c. **At-home assessment.** If you and your child meet the requirements of the study and agree to do the study, we will give you a pedometer, a small tool that measures your child's physical activity, and have you put the tool on your child during the Saturday after the screening/pre-group meeting.

We will also give you a form to record your child's TV, computer, and video game time, on that same Saturday. You will be given detailed directions on how to complete those records.

2. **Group Meetings:** In the second part of the study, families who choose to do the study will attend the group parenting meetings. There are eight weekly group meetings and each meeting lasts for 1½ hours.
3. **Post-Group Meetings:** The third part of the study is two meetings after the end of the group. The first post-group meeting will take place 1-2 weeks after the last group session. The second post-group meeting will take place 3 months after the last group meeting. These meetings will take place at THEARC and are the same as the meetings that occur before the group:
 - a. **Measurements.** We will measure your child's height and weight.
 - b. **Questionnaires.** We will ask you to answer questions about your own and your child's emotional and physical health, your parenting behaviors, and your child's eating behaviors.
 - c. **At-home assessment.** We will give you a pedometer and have you put the tool on your child during the Saturday after the screening/pre-group meeting. We will also give you a form to record your child's TV, computer, and video game time, on that same Saturday.

We will ask you to drop out of the study if:

- Your doctor thinks it is best for your child
- We become aware of a serious mental or physical illness that would impact your ability to participate in the study

C. POTENTIAL RISKS/DISCOMFORT

1. **Psychological testing** involves no risk, but may be a hassle because of the time required for testing. Some parents may also feel uncomfortable being asked about their feelings or behaviors on questionnaires. Should any serious concerns come up about the emotional health of you or your child, you will be given a list of local providers and assisted with finding a provider near your home.
2. **Group Meetings** involve no physical risk, but topics that are personally sensitive will be discussed. While not expected, emotional distress may result from talking about household events or your child's weight status, or from trying to make desired changes within the home. The group leader will be available to provide support throughout the group. If there is concern of the development of a serious emotional health problem, you will be immediately removed from the study and given a list of local providers. If you are in need of an immediate evaluation (e.g. is suicidal with a plan to carry out such actions) while at THEARC, an ambulance will be called to take you to the closest emergency room.

3. **Parenting Behaviors.** There is a risk that through either the assessment or group meetings, we may hear about parenting behaviors that are harmful to your child. If we become aware of anything that could be harmful to your child's health, or another child in your home, we are required by law to report you to the Washington, DC Child Protective Services.
4. **Unrealistic expectations.** The goal of this study is to see if you like the program we are using and find it helpful in making healthy changes within your home. Although unlikely, you may feel disappointed if the program does not meet your expectations. This is not a weight-loss treatment or family therapy study. We will do our best to help you have realistic expectations about the effect of the program on your family.
5. **Time required.** This study lasts about 6 months. The time needed for you to be in the study is 1-2 hours for the screening and pre-group meetings, 2-4 hours for the post-group meetings, and 1½ hours for 8 weeks for group meetings, all of which will take place at THEARC.

D. VOLUNTARY PARTICIPATION

Your participation in this study is voluntary. There will be no penalty or loss of benefits to which you are otherwise entitled if you decide to withdraw from the study.

E. POTENTIAL BENEFITS

There are a number of benefits to this study. For your child, potential benefits include preventing the development of obesity and improving their future health. For parents, potential benefits include learning new ways to parent and to handle stress that may help you make healthy changes in your home. However, as we do not know how well the group will work to help children and parents; there may be no direct benefit to you or your child.

F. ALTERNATIVES TO PARTICIPATION

Your child may be eligible for other studies for children who are at risk for adult obesity. We will inform you of any such studies taking place at Children's National Medical Center of which we are aware, but we may not know about other studies being carried out at other centers. Your child may also choose to go to another health care provider and receive nutrition education or weight loss treatment that could help your child lose weight or maintain their weight.

G. QUESTIONS – WHO TO CALL

We want you to ask questions about any part of this study or consent form either now or at any time in the future. If you have any questions about this study, call the Principal

Investigator, Dr. Nazrat Mirza at (202) 476-3948. If you believe you have been injured as a result of being in this study, you should call the Principal Investigator, Dr. Nazrat Mirza at (202) 476-3948. If you have any questions or concerns about your rights in this research study at any time, please call the Office for the Protection of Human Subjects at (301) 565-8452, the Chief Academic Officer, or the Chair of the Institutional Review Board of the Children's National Medical Center. The last two parties may be reached at (202) 476-5000.

H. CONFIDENTIALITY

We will keep the records of this study confidential. Only the people working on the study will know your name. They will keep this information in case we have to find you later to let you know of any new information that may affect your health. The federal government can review the study records and medical records to make sure we are following the law and protecting the children in the study. Your medical record is confidential, but just like any medical record; there are some exceptions under state and federal law.

HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY

In 1996 the government passed a law known as The Health Insurance Portability and Accountability Act (HIPAA). This privacy law protects your individually identifiable health information (Protected Health Information or PHI). The privacy law requires you to sign an agreement so researchers can use or share your PHI for research purposes. This describes to you how information about you may be used or shared if you are in a research study. It is important that you read this carefully and ask a member of the research team to explain anything you do not understand.

I authorize Nazrat Mirza, MD, ScD and her research staff to create, access, use, and disclose my PHI for the purposes described below.

Protected Health Information that may be used and shared includes:

- * Information that identifies you such as name, address, telephone number, date of birth, Social Security number, and other details about you
- * Information that relates to your health or medical condition from your medical records
- * Information obtained from the study procedures outlined in this consent form, for example: things done to see if you can join the study such as physical exams, blood and urine tests, x-rays and other tests, and any other medical information we learn from you about your health history and family history
- Laboratory results obtained on specimens collected from you (blood, urine, tissue)
- * Questionnaires or surveys you complete
- * Interviews conducted with you by members of the research team
- * Audio/ video recordings
- Other *[please specify]:

The Researchers may use and share my Protected Health Information with:

- ♦ The Principal Investigator, other Investigators, Study Coordinators, and all administrative staff in charge of doing work for the study;
- ♦ Government agencies that have the right to see or review your PHI, including but not limited to the Office of Human Research Protections and the Food and Drug Administration;
- ♦ Children's National Medical Center Institutional Review Board;
- ♦ Audit Committee of the Children's National Medical Center Institutional Review Board;
- ♦ Quality Improvement Program Coordinator and other staff in the Office for the Protection of Human Subjects at Children's National Medical Center.

In addition to the above people and organizations, the Researchers may also use and share my Protected Health Information with:

- ✿ Doctors and staff at other places that are participating in the study. The name(s) of the other place(s) that are participating in this study are: The Uniformed Services University of the Health Sciences, Duke Center for Eating Disorders
- Laboratories and other people or organizations that look at your health information in connection with this study. The name(s) of the laboratory(ies) being used in this study is (are)
- The Sponsor of the study and people that the Sponsor may contract with for the study. The name of the Sponsor is
- The Contract Research Organization (an organization that helps the Sponsor run the study). The name of the Contract Research Organization is
- The Data Safety Monitoring Board (a group of people who examine the medical information during the study)
- The Medical Monitor for the Study (a person who reviews medical information during the study)
- The Patient Advocate or Research Ombudsman (person who watches out for your best interest)
- Any other outside entity who will receive health information

Please list:

Also, your primary physician will be contacted if during the course of the study the researcher learns of a medical condition that needs immediate attention.

Should your health information be disclosed to anyone outside of the study, your information may no longer be protected by HIPAA and this Authorization. However, the use of your health information will still be regulated by applicable federal and state laws.

Storage of PHI in a Database:

We would like to store personal health information collected from you in this study in a database for future research. The database is maintained by the Uniformed Services University of the Health Sciences.

Please indicate your approval of any or all of the following by initialing next to the statement:

My personal health information may be stored in the above named database for future analysis related to this study. Yes No _____ initials

My personal health information may be stored in the above named database. Researchers may contact me to request my authorization for future studies that are not related to this study or the disease named above.

Yes No _____ initials

My personal health information may be stored without any of my identifying information for use in other studies of other diseases. Yes No _____ initials

If you agree to participate in this research study, the research team, the research sponsor (when applicable) and the sponsor's representatives, may use Personally Unidentified Study Data. The Personally Unidentified Study Data does not include your name, address, telephone, or social security number. Instead, the researcher assigns a code to the Personally Unidentified Study Data. Personally Unidentified Study Data may include your date of birth, initials, and dates you received medical care. Personally Unidentified Study Data may also include the health information used, created, or collected in the research study. The research team or the research sponsor may share the Personally Unidentified Study Data with others to perform additional research, place it into research databases, share it with researchers in the U.S. or other countries, or use it to improve the design of future studies. They may also publish it in scientific journals, or share it with business partners of the sponsor and to file applications with U.S. or foreign government agencies to get approval for new drugs or health care products.

You do not have to sign this Consent/Authorization. If you decide not to sign the Authorization, you will not be allowed to participate in the research study.

After signing the Consent/Authorization, you can change your mind and:

- Revoke this Authorization. If you revoke the Authorization, you will send a written letter to: Dr. Nazrat Mirza (202-476-3948) to inform her of your decision. Her address is:

Dr. Nazrat Mirza
Children's National Medical Center
Center for Clinical and Community Research (CCCR)
111 Michigan Ave. NW
Washington, DC 20010-2970

- ♦ If you revoke this Authorization, researchers may only use and disclose the PHI that was collected for this research study before you revoked the Authorization.
- ♦ If you revoke this Authorization your PHI may still be used and disclosed if you should have an adverse event (unexpected side effect).
- ♦ If you change your mind and withdraw the Authorization, you will not be allowed to participate in the study.

You will be allowed to review the information collected for this research study at the conclusion of the trial.

This Authorization does not have an expiration date.

If you have not already received a Notice of Privacy Practices from Children's National Medical Center, you may request a copy and will be given one. If you have any questions or concerns about your privacy rights, you may contact the Children's Hospital Privacy Officer at 301-572-6348.

I. Payment for Medical Care for Research-related Injury:

Children's National Medical Center cannot promise that the risks we have told you about or other unknown problems will not happen. If you think that something unexpected happened because you were in the study, please call the Principal Investigator at (202) 476-3948, or the Chief Academic Officer of the Children's National Medical Center at (202) 476-5000. If something unexpected happened resulting directly from your participation in this research study, we will give your child any urgent medical emergency treatment needed if the injury is reported in a timely manner. The Hospital will seek payment from your health insurance company or other third-party payor for any medical care or services you receive. The Hospital has no program to provide you with any additional payments as a result of any injuries.

J. ADDITIONAL ELEMENTS

1. Consequences of withdrawing

There are no consequences to withdrawing from this study. Your participation is voluntary and you may choose to terminate your participation in this study at any time.

2. Termination from the study at discretion of investigator

If the research team has reason to believe that the study may not be a good fit for you or your child, we may discontinue your family's participation in the study. For example, if you will not be able to come to the screening visits before starting the group sessions or if you will not be able to attend most of the group sessions, you may not be a good fit for the study. In addition, if we become aware of any serious mental or physical illness that may impact your ability to participate or may require a higher level of care, we may end your participation in the study. After stopping your participation in the study, if you are willing, we may ask that she return to THEARC for the scheduled follow-up visits, to follow your child's body weight and eating/activity patterns, as well as your parenting behaviors.

3. Approximate number of total participants

We expect that between 20-30 parents and their child to participate in the study. Each group will have between 3-10 parents.

4. Compensation

You will be paid for your time and for the difficulty of coming to assessment and group meetings. You will be paid \$25 after the screening and pre-group meeting, \$25 between sessions 4 and 5, and \$25 after both post-group meetings, for a total of up to \$100. If you choose to stop participating in the study before the study is over, you will not be paid for parts of the study you do not complete.

CONSENT/AUTHORIZATION:

I am the participant or I am authorized to act on behalf of the participant. I have read this information and will receive a copy of this form after it is signed.

By signing this form, you agree that you have talked to your doctor about the study and understand it, and you want to be in the study. You agree that we have talked to you about the risks and benefits of the study, and about other choices. You may decide to stop being in this study at any time and no one will mind and nothing will change about your medical care other than not being in the study. Copies of this form will be:

- (1) Kept in the study file by the Principal Investigator;
- (2) Put in your medical record; and
- (3) Given to you to keep.

Please call the Principal Investigator, Dr. Nazrat Mirza, at 202-476-3948, if you have any questions.

Printed Name of Participant: _____

Medical Record Number: _____

Printed Name of Parent(s)/Guardian(s): _____

Signature of Participant: _____ Date: _____
(Participant must be 18 years of age or older)

Signature of Parent(s)/Guardian(s): _____ Date: _____

Witness (to signatures): _____ Date: _____
(may be investigator)

AFFIDAVIT OF PERSON OBTAINING CONSENT: I certify that I have explained to the above individual(s) the nature and purpose of the study, potential benefits, and possible risks associated with participation in this study. I have answered any questions that have been raised.

Printed Name of Individual Obtaining Consent: _____

Title: _____ Signature: _____ Date: _____

APPENDIX D: PARENT REPORT QUESTIONNAIRES

Health Awareness Interview

(Adapted from Young-Hyman et al., 2000)

Please circle the appropriate answer to the following questions:

1. Which best describes your child's weight?
 - Underweight
 - Just right
 - Overweight
 - Very overweight
2. Which best describes your child's general appearance?
 - Small frame
 - Medium frame
 - Large frame
3. Do you think your child's weight is a health problem?
 - Yes
 - No
4. How much do you worry about your child's current weight?
 - No worry
 - A slight worry
 - A lot of worry
5. How much do you worry about your child becoming overweight in the future?
 - No worry
 - A slight worry
 - A lot of worry
6. How important is it to you to make sure that your child is at a healthy weight?
 - Not important at all
 - Somewhat important
 - Very important
7. Has your doctor expressed concern to you about your child's weight?
 - Yes
 - No
8. Has your doctor discussed with you future health problems related to being overweight?
 - Yes
 - No
9. Has a family member or friend expressed concern to you about your child's weight?
 - Yes
 - No
10. Have you tried anything to help your child lose weight?
 - Yes
 - No

11. Have any family members or friends expressed disapproval, or gotten in the way of you trying to make healthy changes related to your child's weight?

- Yes
- No

LIFESTYLE BEHAVIOUR CHECKLIST

Below is a list of behaviours parents with overweight children often have to manage. For each item: (1) circle the number that best describes how much of a problem that behaviour has been with your child in the last month, and (2) rate how confident you are in dealing with it. If that behaviour is not currently occurring, rate how confident you are that you could successfully deal with your child's behaviour if it did occur. Remember to put a confidence rating for **every** item.

Rate your confidence from 1 (Certain I can't do it) to 10 (Certain I can do it).

	TO WHAT EXTENT HAS THIS BEHAVIOUR BEEN A PROBLEM FOR YOU WITH YOUR CHILD?							HOW CONFIDENT ARE YOU IN DEALING WITH IT?
	Not at all	A little	Somewhat	Much	Very much			
1. Eats too quickly	1	2	3	4	5	6	7	<input type="checkbox"/>
2. Eats too much	1	2	3	4	5	6	7	<input type="checkbox"/>
3. Eats unhealthy snacks	1	2	3	4	5	6	7	<input type="checkbox"/>
4. Whinges or whines about food	1	2	3	4	5	6	7	<input type="checkbox"/>
5. Yells about food	1	2	3	4	5	6	7	<input type="checkbox"/>
6. Throws a tantrum about food	1	2	3	4	5	6	7	<input type="checkbox"/>
7. Refuses to eat certain foods (i.e. fussy eating)	1	2	3	4	5	6	7	<input type="checkbox"/>
8. Argues about food (e.g. when you say <i>No more</i>)	1	2	3	4	5	6	7	<input type="checkbox"/>
9. Demands extra helpings at meals	1	2	3	4	5	6	7	<input type="checkbox"/>
10. Requests food continuously between meals	1	2	3	4	5	6	7	<input type="checkbox"/>
11. Demands food when shopping or on outings	1	2	3	4	5	6	7	<input type="checkbox"/>
12. Sneaks food when they know they are not supposed to	1	2	3	4	5	6	7	<input type="checkbox"/>
13. Hides food	1	2	3	4	5	6	7	<input type="checkbox"/>
14. Steals food (e.g. from other children's lunchboxes)	1	2	3	4	5	6	7	<input type="checkbox"/>
15. Eats food to comfort themselves when feeling let down or depressed	1	2	3	4	5	6	7	<input type="checkbox"/>
16. Watches too much television	1	2	3	4	5	6	7	<input type="checkbox"/>
17. Spends too much time playing video or computer games	1	2	3	4	5	6	7	<input type="checkbox"/>

18. Complains about doing physical activity (e.g. <i>This is boring, I'm too tired, My leg hurts</i>)	1	2	3	4	5	6	7	<input type="checkbox"/>
19. Refuses to do physical activity	1	2	3	4	5	6	7	<input type="checkbox"/>
20. Complains about being unfit or feeling low in energy	1	2	3	4	5	6	7	<input type="checkbox"/>
21. Complains about being overweight	1	2	3	4	5	6	7	<input type="checkbox"/>
22. Complains about being teased	1	2	3	4	5	6	7	<input type="checkbox"/>
23. Complains about not having enough friends	1	2	3	4	5	6	7	<input type="checkbox"/>
24. Complains about being unattractive	1	2	3	4	5	6	7	<input type="checkbox"/>
25. Complains about not fitting into clothes	1	2	3	4	5	6	7	<input type="checkbox"/>

Note. Adapted from "The Lifestyle Behaviour Checklist: A measure of weight-related problem behaviour in obese children," by F. West & M.R. Sanders, 2009, *International Journal of Pediatric Obesity*.

TABLE 1
Toddler Care Questionnaire¹

Dear Mothers,

Please complete the items below. Your responses on the questionnaire are confidential and will help us to improve our services to mothers of young children. Circle the appropriate letter to indicate how much confidence you have with the following:

A	B	C	D	E	CONFIDENCE
very little	←	→	quite a lot		
A	B	C	D	E	1) Knowing which toys are appropriate for your child's age.
A	B	C	D	E	2) Knowing how to encourage your child's language development.
A	B	C	D	E	3) Knowing about common fears children have at this age.
A	B	C	D	E	4) Knowing what to do to help your child develop hand coordination (for example, using a spoon, stacking blocks, etc.).
A	B	C	D	E	5) Knowing how to help your child develop body coordination (for example, walking, climbing).
A	B	C	D	E	6) Knowing how to manage toilet training.
A	B	C	D	E	7) Knowing how feeding patterns change between 12 months and 36 months.
A	B	C	D	E	8) Knowing how to make your home safe for your child.
A	B	C	D	E	9) Knowing which situations are likely to upset your child.
A	B	C	D	E	10) Knowing which situations your child is likely to enjoy.
A	B	C	D	E	11) Predicting how your child will react to new people and places.
A	B	C	D	E	12) Knowing your child's daily sleep schedule.
A	B	C	D	E	13) Knowing what foods your child will and won't eat.
A	B	C	D	E	14) Predicting whether your child will like a new toy.
A	B	C	D	E	15) Knowing what your child's different cries mean (for example, tiredness, hunger, pain, fear, boredom, frustration, etc.).
A	B	C	D	E	16) Knowing how to relieve your child's distress (for example, distress due to being tired, hungry, in pain, frightened, bored, frustrated, etc.).
A	B	C	D	E	17) Involving your child in activities you both enjoy.
A	B	C	D	E	18) Knowing when your child seems to want affection from you.
A	B	C	D	E	19) Being comfortable in showing affection to your child.
A	B	C	D	E	20) Getting your child to smile or laugh.
A	B	C	D	E	21) Developing your child's interest in new things.
A	B	C	D	E	22) Knowing your child's favorite toys and games.
A	B	C	D	E	23) Knowing how to help your child play with other children.
A	B	C	D	E	24) Helping your child to adjust to new situations (for example, a new babysitter, going to new places).
A	B	C	D	E	25) Setting limits on your child's destructive behaviors (for example, tearing books, breaking valuable items).
A	B	C	D	E	26) Setting limits on your child's behavior if it looks dangerous (for example, playing with matches, electric outlets, wires, etc.).
A	B	C	D	E	27) Knowing what kinds of discipline do not work with your child.
A	B	C	D	E	28) Knowing what to do when your child has a temper tantrum.
A	B	C	D	E	29) Getting your child to bed without a power struggle.
A	B	C	D	E	30) Keeping a consistent bedtime hour for your child.
A	B	C	D	E	31) Knowing when rules can be "bent" or modified and when they should not be.
A	B	C	D	E	32) Getting back to "friendly terms" with your child soon after a problem behavior has ended.
A	B	C	D	E	33) Knowing whether your style of parenting will "spoil" your child.
A	B	C	D	E	34) Managing your child's aggressiveness with other children (for example, hitting, biting, pushing others).
A	B	C	D	E	35) Finding supportive services and people in your community for you and your child (for example, other mothers of young children, play groups, daycare services, preschools, etc.).
A	B	C	D	E	36) Knowing how to manage non-emergency illnesses at home (for example, fever, diarrhea, minor injuries).
A	B	C	D	E	37) Managing separations from your child (for example, to go to the store, to go to work, to go out for the evening).
					38) Now go back and circle the number of any items you would like to know more about. Thank you.

©1986, Deborah Gross, D.N.Sc., R.N., and Lorraine Rodissano, Ph.D.

Permission to use the Toddler Care Questionnaire for research purposes, and scoring instructions can be obtained from Deborah Gross, Rush-Presbyterian-St. Luke's Medical Center, Department of Psychiatric Nursing, 1763 W. Congress Pkwy., Chicago, IL 60612.

Parenting Styles and Dimensions Questionnaire

REMEMBER: For each item, rate how often you exhibit this behavior with your child.

I EXHIBIT THIS BEHAVIOR:

- 1 = Never
- 2 = Once In Awhile
- 3 = About Half of the Time
- 4 = Very Often
- 5 = Always

1. I am responsive to my child's feelings and needs.
2. I use physical punishment as a way of disciplining my child.
3. I take my child's desires into account before asking him/her to do something.
4. When my child asks why he/she has to conform, I state: because I said so, or I am your parent and I want you to.
5. I explain to my child how I feel about the child's good and bad behavior.
6. I spank when my child is disobedient.
7. I encourage my child to talk about his/her troubles.
8. I find it difficult to discipline my child.
9. I encourage my child to freely express (himself)(herself) even when disagreeing with me.
10. I punish by taking privileges away from my child with little if any explanations.
11. I emphasize the reasons for rules.
12. I give comfort and understanding when my child is upset.
13. I yell or shout when my child misbehaves.
14. I give praise when my child is good.
15. I give into my child when the child causes a commotion about something.
16. I explode in anger towards my child.
17. I threaten my child with punishment more often than actually giving it.
18. I take into account my child's preferences in making plans for the family.
19. I grab my child when being disobedient.
20. I state punishments to my child and do not actually do them.
21. I show respect for my child's opinions by encouraging my child to express them.
22. I allow my child to give input into family rules.
23. I scold and criticize to make my child improve.
24. I spoil my child.
25. I give my child reasons why rules should be obeyed.
26. I use threats as punishment with little or no justification.
27. I have warm and intimate times together with my child.

_____ 28. I punish by putting my child off somewhere alone with little if any explanations.

_____ 29. I help my child to understand the impact of behavior by encouraging my child to talk about the consequences of his/her own actions.

_____ 30. I scold or criticize when my child's behavior doesn't meet my expectations.

_____ 31. I explain the consequences of the child's behavior.

_____ 32. I slap my child when the child misbehaves..

From: Robinson, C.C., Mandleco, B., Olsen, S.F., & Hart, C.H. (1995). Authoritative, authoritarian, and permissive parenting practices: Development of a new measure. Psychological Reports, 77, 819-830.

Child Feeding Questionnaire

Adapted from Birch, L.L., et al., 2001, by Anderson et al., 2005

1. When your child is at home, how often are you responsible for feeding her?
 - a. Never
 - b. Seldom
 - c. Half of the time
 - d. Most of the time
 - e. Always
2. How often are you responsible for deciding what your child's portion sizes are?
 - a. Never
 - b. Seldom
 - c. Half of the time
 - d. Most of the time
 - e. Always
3. How often are you responsible for deciding if your child has eaten the right kind of foods?
 - a. Never
 - b. Seldom
 - c. Half of the time
 - d. Most of the time
 - e. Always
4. You see your child as:
 - a. Markedly underweight
 - b. Underweight
 - c. Average
 - d. Overweight
 - e. Markedly overweight
5. How concerned are you about your child eating too much when you are not around her?
 - a. Unconcerned
 - b. A little concerned
 - c. Concerned
 - d. Fairly concerned
 - e. Very concerned
6. How concerned are you about your child having to diet to maintain a desirable weight?
 - a. Unconcerned
 - b. A little concerned
 - c. Concerned
 - d. Fairly concerned
 - e. Very concerned
7. How concerned are you about your child becoming over weight?
 - a. Unconcerned
 - b. A little concerned
 - c. Concerned
 - d. Fairly concerned
 - e. Very concerned
8. I have to be sure that my child does not eat too many sweets (candy, icecream, cake or pastries)
 - a. Disagree
 - b. Slightly disagree
 - c. Neutral
 - d. Slightly agree
 - e. Agree

9. I have to be sure that my child does not eat too many high-fat foods

- Disagree
- Slightly disagree
- Neutral
- Slightly agree
- Agree

10. If I did not guide or regulate my child's eating, he/she would eat too many junk foods

- Disagree
- Slightly disagree
- Neutral
- Slightly agree
- Agree

11. My child should always eat all of the food on her plate

- Disagree
- Slightly disagree
- Neutral
- Slightly agree
- Agree

12. I have to be especially careful to make sure my child eats enough

- Disagree
- Slightly disagree
- Neutral
- Slightly agree
- Agree

13. If my child says "I'm not hungry", I try to get him/her to eat anyway

- Disagree
- Slightly disagree
- Neutral
- Slightly agree
- Agree

14. If I did not guide or regulate my child's eating, she would eat much less than she should

- Disagree
- Slightly disagree
- Neutral
- Slightly agree
- Agree

15. How much do you keep track of the sweets (candy, ice cream cake, pies, pastries) that your child eats?

- Never
- Rarely
- Sometimes
- Mostly
- Always

16. How much do you keep track of the snack food (potato chips, Doritos, cheese puffs) that your child eats?

- Never
- Rarely
- Sometimes
- Mostly
- Always

17. How much do you keep track of the high-fat foods that your child eats?

- Never
- Rarely
- Sometimes
- Mostly
- Always

Child Eating Behaviour Questionnaire (CEBQ)

Please read the following statements and tick the boxes most appropriate to your child's eating behaviour.

	Never	Rarely	Sometimes	Often	Always
My child loves food	<input type="checkbox"/>				
My child eats more when worried	<input type="checkbox"/>				
My child has a big appetite	<input type="checkbox"/>				
My child finishes his/her meal quickly	<input type="checkbox"/>				
My child is interested in food	<input type="checkbox"/>				
My child is always asking for a drink	<input type="checkbox"/>				
My child refuses new foods at first	<input type="checkbox"/>				
My child eats slowly	<input type="checkbox"/>				
My child eats less when angry	<input type="checkbox"/>				
My child enjoys tasting new foods	<input type="checkbox"/>				
My child eats less when s/he is tired	<input type="checkbox"/>				
My child is always asking for food	<input type="checkbox"/>				
My child eats more when annoyed	<input type="checkbox"/>				
If allowed to, my child would eat too much	<input type="checkbox"/>				
My child eats more when anxious	<input type="checkbox"/>				
My child enjoys a wide variety of foods	<input type="checkbox"/>				
My child leaves food on his/her plate at the end of a meal	<input type="checkbox"/>				
My child takes more than 30 minutes to finish a meal	<input type="checkbox"/>				

	Never	Rarely	Sometimes	Often	Always
Given the choice, my child would eat most of the time	<input type="checkbox"/>				
My child looks forward to mealtimes	<input type="checkbox"/>				
My child gets full before his/her meal is finished	<input type="checkbox"/>				
My child enjoys eating	<input type="checkbox"/>				
My child eats more when she is happy	<input type="checkbox"/>				
My child is difficult to please with meals	<input type="checkbox"/>				
My child eats less when upset	<input type="checkbox"/>				
My child gets full up easily	<input type="checkbox"/>				
My child eats more when s/he has nothing else to do	<input type="checkbox"/>				
Even if my child is full up s/he finds room to eat his/her favourite food	<input type="checkbox"/>				
If given the chance, my child would drink continuously throughout the day	<input type="checkbox"/>				
My child cannot eat a meal if s/he has had a snack just before	<input type="checkbox"/>				
If given the chance, my child would always be having a drink	<input type="checkbox"/>				
My child is interested in tasting food s/he hasn't tasted before	<input type="checkbox"/>				
My child decides that s/he doesn't like a food, even without tasting it	<input type="checkbox"/>				
If given the chance, my child would always have food in his/her mouth	<input type="checkbox"/>				
My child eats more and more slowly during the course of a meal	<input type="checkbox"/>				

From: Wardle, J., C. A. Guthrie, et al. (2001). "Development of the Children's Eating Behaviour Questionnaire." *Journal of Child Psychology and Psychiatry* 42: 963-970.

Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Name _____ Date _____

Age _____ Gender (Circle): **M** **F** Other _____

0 = Never **1 = Almost Never** **2 = Sometimes** **3 = Fairly Often** **4 = Very Often**

1. In the last month, how often have you been upset because of something that happened unexpectedly? 0 1 2 3 4
2. In the last month, how often have you felt that you were unable to control the important things in your life? 0 1 2 3 4
3. In the last month, how often have you felt nervous and "stressed"? 0 1 2 3 4
4. In the last month, how often have you felt confident about your ability to handle your personal problems? 0 1 2 3 4
5. In the last month, how often have you felt that things were going your way? 0 1 2 3 4
6. In the last month, how often have you found that you could not cope with all the things that you had to do? 0 1 2 3 4
7. In the last month, how often have you been able to control irritations in your life? 0 1 2 3 4
8. In the last month, how often have you felt that you were on top of things? 0 1 2 3 4
9. In the last month, how often have you been angered because of things that were outside of your control? 0 1 2 3 4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? 0 1 2 3 4

Please feel free to use the *Perceived Stress Scale* for your research.

Mind Garden, Inc.

info@mindgarden.com

www.mindgarden.com

References

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Marmelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 396-305.
Cohen, S. and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S. and Oskamp, S. (Eds.) *The Social Psychology of Health*. Newbury Park, CA: Sage, 1988.



Please print. Be sure
to answer all items.

CHILD BEHAVIOR CHECKLIST FOR AGES 1½-5

For office use only
ID #

CHILD'S FULL NAME	First	Middle	Last	PARENTS' USUAL TYPE OF WORK, even if not working now. Please be specific — for example, auto mechanic, high school teacher, homemaker, laborer, lathe operator, shoe salesman, army sergeant.
CHILD'S GENDER	CHILD'S AGE	CHILD'S ETHNIC GROUP OR RACE		FATHER'S TYPE OF WORK _____
<input type="checkbox"/> Boy <input type="checkbox"/> Girl				MOTHER'S TYPE OF WORK _____
TODAY'S DATE Mo. Day Year		CHILD'S BIRTHDATE Mo. Day Year		THIS FORM FILLED OUT BY: (print your full name)

Please fill out this form to reflect your view of the child's behavior even if other people might not agree. Feel free to write additional comments beside each item and in the space provided on page 2. **Be sure to answer all items.**

Below is a list of items that describe children. For each item that describes the child *now or within the past 2 months*, please circle the 2 if the item is *very true or often true* of the child. Circle the 1 if the item is *somewhat or sometimes true* of the child. If the item is *not true* of the child, circle the 0. Please answer all items as well as you can, even if some do not seem to apply to the child.

0 = Not True (as far as you know)			1 = Somewhat or Sometimes True			2 = Very True or Often True				
0	1	2	1.	Aches or pains (without medical cause; do not include stomach or headaches)	0	1	2	30. Easily jealous		
0	1	2	2.	Acts too young for age	0	1	2	31. Eats or drinks things that are not food—don't include sweets (describe): _____		
0	1	2	3.	Afraid to try new things	0	1	2	32. Feels certain animals, situations, or places (describe): _____		
0	1	2	4.	Avoids looking others in the eye	0	1	2	33. Feelings are easily hurt		
0	1	2	5.	Can't concentrate, can't pay attention for long	0	1	2	34. Gets hurt a lot, accident-prone		
0	1	2	6.	Can't sit still, restless, or hyperactive	0	1	2	35. Gets in many fights		
0	1	2	7.	Can't stand having things out of place	0	1	2	36. Gets into everything		
0	1	2	8.	Can't stand waiting; wants everything now	0	1	2	37. Gets too upset when separated from parents		
0	1	2	9.	Chews on things that aren't edible	0	1	2	38. Has trouble getting to sleep		
0	1	2	10.	Clings to adults or too dependent	0	1	2	39. Headaches (without medical cause)		
0	1	2	11.	Constantly seeks help	0	1	2	40. Hits others		
0	1	2	12.	Constipated; doesn't move bowels (when not sick)	0	1	2	41. Holds his/her breath		
0	1	2	13.	Cries a lot	0	1	2	42. Hurts animals or people without meaning to		
0	1	2	14.	Cruel to animals	0	1	2	43. Looks unhappy without good reason		
0	1	2	15.	Defiant	0	1	2	44. Angry moods		
0	1	2	16.	Demands must be met immediately	0	1	2	45. Nausea, feels sick (without medical cause)		
0	1	2	17.	Destroys his/her own things	0	1	2	46. Nervous movements or twitching (describe): _____		
0	1	2	18.	Destroys things belonging to his/her family or other children	0	1	2	47. Nervous, highstrung, or tense		
0	1	2	19.	Diarrhea or loose bowels (when not sick)	0	1	2	48. Nightmares		
0	1	2	20.	Disobedient	0	1	2	49. Overeating		
0	1	2	21.	Disturbed by any change in routine	0	1	2	50. Overtired		
0	1	2	22.	Doesn't want to sleep alone	0	1	2	51. Shows panic for no good reason		
0	1	2	23.	Doesn't answer when people talk to him/her	0	1	2	52. Painful bowel movements (without medical cause)		
0	1	2	24.	Doesn't eat well (describe): _____	0	1	2	53. Physically attacks people		
0	1	2	25.	Doesn't get along with other children	0	1	2	54. Picks nose, skin, or other parts of body (describe): _____		
0	1	2	26.	Doesn't know how to have fun; acts like a little adult						
0	1	2	27.	Doesn't seem to feel guilty after misbehaving						
0	1	2	28.	Doesn't want to go out of home						
0	1	2	29.	Easily frustrated						

Be sure you answered all items. Then see other side.

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7-28-00 Edition

Please print your answers. Be sure to answer all items.

0 = Not True (as far as you know)			1 = Somewhat or Sometimes True			2 = Very True or Often True		
0	1	2	55. Plays with own sex parts too much	0	1	2	79. Rapid shifts between sadness and excitement	
0	1	2	56. Poorly coordinated or clumsy	0	1	2	80. Strange behavior (describe): _____	
0	1	2	57. Problems with eyes (without medical cause) (describe): _____	0	1	2	81. Stubborn, sullen, or irritable	
0	1	2	58. Punishment doesn't change his/her behavior	0	1	2	82. Sudden changes in mood or feelings	
0	1	2	59. Quickly shifts from one activity to another	0	1	2	83. Sulks a lot	
0	1	2	60. Rashes or other skin problems (without medical cause)	0	1	2	84. Talks or cries out in sleep	
0	1	2	61. Refuses to eat	0	1	2	85. Temper tantrums or hot temper	
0	1	2	62. Refuses to play active games	0	1	2	86. Too concerned with neatness or cleanliness	
0	1	2	63. Repeatedly rocks head or body	0	1	2	87. Too fearful or anxious	
0	1	2	64. Resists going to bed at night	0	1	2	88. Uncooperative	
0	1	2	65. Resists toilet training (describe): _____	0	1	2	89. Underactive, slow moving, or lacks energy	
0	1	2	66. Screams a lot	0	1	2	90. Unhappy, sad, or depressed	
0	1	2	67. Seems unresponsive to affection	0	1	2	91. Unusually loud	
0	1	2	68. Self-conscious or easily embarrassed	0	1	2	92. Upset by new people or situations (describe): _____	
0	1	2	69. Selfish or won't share	0	1	2	93. Vomits, throwing up (without medical cause)	
0	1	2	70. Shows little affection toward people	0	1	2	94. Wakes up often at night	
0	1	2	71. Shows little interest in things around him/her	0	1	2	95. Wanders away	
0	1	2	72. Shows too little fear of getting hurt	0	1	2	96. Wants a lot of attention	
0	1	2	73. Too shy or timid	0	1	2	97. Whining	
0	1	2	74. Sleeps less than most kids during day and/or night (describe): _____	0	1	2	98. Withdrawn, doesn't get involved with others	
0	1	2	75. Smears or plays with bowel movements	0	1	2	99. Worries	
0	1	2	76. Speech problem (describe): _____	0	1	2	100. Please write in any problems the child has that were not listed above.	
0	1	2	77. Stares into space or seems preoccupied	0	1	2	_____	
0	1	2	78. Stomachaches or cramps (without medical cause)	0	1	2	_____	

Does the child have any illness or disability (either physical or mental)?

No Yes—Please describe:

Please be sure you have answered all items.
Underline any you are concerned about.

What concerns you most about the child?

Please describe the best things about the child:

HOW MANY DAYS LAST WEEK DID YOU EAT OR DRINK IT?

	None last week	1 day last week	2 days last week	3-4 days last week	5-6 days last week	Every day last week			
Refried beans	<input type="radio"/>								
Hamburgers, cheeseburgers	<input type="radio"/>								
Hot dogs, corn dogs, or sausage	<input type="radio"/>								
Lunch meat like boloney, ham, Lunchables	<input type="radio"/>								
Pizza or pizza pockets	<input type="radio"/>								
Spaghetti or ravioli with tomato sauce	<input type="radio"/>								
Macaroni and cheese	<input type="radio"/>								
Chicken, including nuggets, wings, tenders, also in sandwiches or stew	<input type="radio"/>								
Fish, fish sticks or sandwiches, tuna, shrimp	<input type="radio"/>								
Burritos or tacos	<input type="radio"/>								
Beef like roast, steak or in sandwiches	<input type="radio"/>								
Meat balls, meat loaf, beef stew, Hamburger Helper	<input type="radio"/>								
Pork, like chops, roast, ribs	<input type="radio"/>								
Popcorn	<input type="radio"/>								
Snack chips like potato chips, Doritos, Fritos, tortilla chips	<input type="radio"/>								
Ice cream	<input type="radio"/>								
Candy, candy bars	<input type="radio"/>								
Cookies, donuts, cakes like Ho-Hos	<input type="radio"/>								
Cheese. Remember cheese in sandwiches or nachos with cheese or quesadillas	<input type="radio"/>								
Whole wheat bread or rolls (NOT white bread)	<input type="radio"/>								

HOW MUCH IN ONE DAY?

	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1 small	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1 large	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
2 large	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1 slice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
2 slices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
3+ slices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1/2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A few	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Small bag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Large bag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1 scoop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
2 scoops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
3 scoops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Mini	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Small	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Large	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A little	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Some	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
A lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1 slice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
2 slices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
3+ slices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
1 slice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
2 slices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
3 slices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			

What kind of cereal did you eat? (MARK THE ONE YOU ATE THE MOST OF)

Plain Cheerios, Grape Nuts, Shredded Wheat, Wheaties, Wheat Chex, Kix
 Honey Nut Cheerios, Cap'n Crunch, Lucky Charms, Life, Golden Grahams, Frosted Mini Wheats, Raisin Bran
 Other sweet cereals, like Frosted Flakes, Froot Loops
 Any other cereal, like Corn Flakes, Rice Krispies

What kind of milk did you drink? (MARK ONLY ONE) Whole milk Low fat 1% milk Chocolate milk Lactaid milk
 Reduced fat 2% Nonfat milk Soy milk Don't know
 milk

Please tell us about yourself

Are you How old 2 3 4 5 6 7 8 9 10
 Male Female are you?
 11 12 13 14 15 16 17

DE Mark Reflex® EW-283059-1:8

How Many Days Last Week Did You Eat or Drink It?										How Much in One Day?					
	None last week	1 day last week	2 days last week	3-4 days last week	5-6 days last week	Every day last week									
Refried beans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Hamburgers, cheeseburgers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Hot dogs, corn dogs, or sausage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Lunch meat like boloney, ham, Lunchables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Pizza or pizza pockets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Spaghetti or ravioli with tomato sauce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Macaroni and cheese	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Chicken, including nuggets, wings, tenders, also in sandwiches or stew	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Fish, fish sticks or sandwiches, tuna, shrimp	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Burritos or tacos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Beef like roast, steak or in sandwiches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Meat balls, meat loaf, beef stew, Hamburger Helper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Pork, like chops, roast, ribs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Popcorn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Snack chips like potato chips, Doritos, Fritos, tortilla chips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Ice cream	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Candy, candy bars	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Cookies, donuts, cakes like Ho-Hos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Cheese. Remember cheese in sandwiches or nachos with cheese or quesadillas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
Whole wheat bread or rolls (NOT white bread)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			
What kind of cereal did you eat? (MARK THE ONE YOU ATE THE MOST OF)															
<input type="radio"/> Plain Cheerios, Grape Nuts, Shredded Wheat, Wheaties, Wheat Chex, Kix <input type="radio"/> Honey Nut Cheerios, Cap'n Crunch, Lucky Charms, Life, Golden Grahams, Frosted Mini Wheats, Raisin Bran <input type="radio"/> Other sweet cereals, like Frosted Flakes, Froot Loops <input type="radio"/> Any other cereal, like Corn Flakes, Rice Krispies															
What kind of milk did you drink? (MARK ONLY ONE)				<input type="radio"/> Whole milk <input type="radio"/> Reduced fat 2%			<input type="radio"/> Low fat 1% milk <input type="radio"/> Nonfat milk			<input type="radio"/> Chocolate milk <input type="radio"/> Soy milk			<input type="radio"/> Lactaid milk <input type="radio"/> Don't know		
Please tell us about yourself															
Are you	<input type="radio"/>	<input type="radio"/>	How old are you?	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5	<input type="radio"/> 6	<input type="radio"/> 7	<input type="radio"/> 8	<input type="radio"/> 9	<input type="radio"/> 10			
	Male	Female		<input type="radio"/> 11	<input type="radio"/> 12	<input type="radio"/> 13	<input type="radio"/> 14	<input type="radio"/> 15	<input type="radio"/> 16	<input type="radio"/> 17					

The Parenting Stress Index-Short Form

1. I often have the feeling that I cannot handle things very well.	SA	A	NS	D	SD
2. I find myself giving up more of my life to meet my children's needs than I ever expected.	SA	A	NS	D	SD
3. I feel trapped by my responsibilities as a parent.	SA	A	NS	D	SD
4. Since having this child, I have been unable to do new and different things.	SA	A	NS	D	SD
5. Since having a child, I feel that I am almost never able to do things that I like to do.	SA	A	NS	D	SD
6. I am unhappy with the last purchase of clothing I made for myself.	SA	A	NS	D	SD
7. There are quite a few things that bother me about my life.	SA	A	NS	D	SD
8. Having a child has caused more problems than I expected in my relationship with my spouse (or male/female friend).	SA	A	NS	D	SD
9. I feel alone and without friends.	SA	A	NS	D	SD
10. When I go to a party, I usually expect not to enjoy myself.	SA	A	NS	D	SD
11. I am not as interested in people as I used to be.	SA	A	NS	D	SD
12. I don't enjoy things as I used to.	SA	A	NS	D	SD
13. My child rarely does things for me that make me feel good.	SA	A	NS	D	SD
14. Sometimes I feel my child doesn't like me and doesn't want to be close to me.	SA	A	NS	D	SD
15. My child smiles at me much less than I expected.	SA	A	NS	D	SD
16. When I do things for my child, I get the feeling that my efforts are not appreciated very much.	SA	A	NS	D	SD
17. When playing, my child doesn't often giggle or laugh.	SA	A	NS	D	SD
18. My child doesn't seem to learn as quickly as most children.	SA	A	NS	D	SD
19. My child doesn't seem to smile as much as most children.	SA	A	NS	D	SD
20. My child is not able to do as much as I expected.	SA	A	NS	D	SD
21. It takes a long time and it is very hard for my child to get used to new things.	SA	A	NS	D	SD

For the next statement, choose your response from the choices "1" to "5" below.

22. I feel that I am:	1. not very good at being a parent	2. a person who has some trouble being a parent	3. an average parent	4. a better than average parent	5. a very good parent	1	2	3	4	5
23. I expected to have closer and warmer feelings for my child than I do and this bothers me.	SA	A	NS	D	SD					
24. Sometimes my child does things that bother me just to be mean.	SA	A	NS	D	SD					
25. My child seems to cry or fuss more often than most children.	SA	A	NS	D	SD					
26. My child generally wakes up in a bad mood.	SA	A	NS	D	SD					
27. I feel that my child is very moody and easily upset.	SA	A	NS	D	SD					
28. My child does a few things which bother me a great deal.	SA	A	NS	D	SD					
29. My child reacts very strongly when something happens that my child doesn't like.	SA	A	NS	D	SD					
30. My child gets upset easily over the smallest thing.	SA	A	NS	D	SD					
31. My child's sleeping or eating schedule was much harder to establish than I expected.	SA	A	NS	D	SD					

For the next statement, choose your response from the choices "1" to "5" below.

32. I have found that getting my child to do something or stop doing something is:	1	2	3	4	5
1. much harder than I expected					
2. somewhat harder than I expected					
3. about as hard as I expected					
4. somewhat easier than I expected					
5. much easier than I expected					

For the next statement, choose your response from the choices "10+" to "1-3."

33. Think carefully and count the number of things which your child does that bother you.	10+	8-9	6-7	4-5	1-3
For example: dawdles, refuses to listen, overactive, cries, interrupts, fights, whines, etc.					
34. There are some things my child does that really bother me a lot.	SA	A	NS	D	SD
35. My child turned out to be more of a problem than I had expected.	SA	A	NS	D	SD
36. My child makes more demands on me than most children.	SA	A	NS	D	SD

Saturday Activity Log

Please record the amount of time your child spends in engaging in computer, TV, or video game time. Also list time spent in any other activity requiring little to no physical activity.

*Reminder: place the pedometer on your child when he/she first wakes up

	<u>Morning</u>	<u>Afternoon</u>	<u>Evening</u>
Computer			
TV			
Video Game			
Other _____			
Other _____			

Please record the final pedometer reading, taken after your child gets in the bed at the end of the day: _____

Thank you!

APPENDIX E: FEASIBILITY AND ACCEPTABILITY QUESTIONNAIRES

Program Acceptability Questionnaire*

Please answer these questions that deal with your reactions to the proposed parent training program. Circle the number that best describes your reactions.

1. Overall, did you like this parenting program, meaning you found it acceptable?
 - a. Completely not acceptable
 - b. Somewhat not acceptable
 - c. Neither acceptable nor not acceptable (neutral)
 - d. Somewhat acceptable
 - e. Very acceptable
2. If this intervention was not acceptable, why?

3. Do you think the parenting information and skills taught in this parenting program would be helpful and effective for preschool aged youth?
 - a. Really unhelpful
 - b. A little unhelpful
 - c. Not helpful but not unhelpful
 - d. A little helpful
 - e. Very helpful
4. How likely is this parent program to have a negative impact on parents like you?
 - a. Very likely
 - b. A little likely
 - c. Neither likely nor unlikely (neutral)
 - d. A little unlikely
 - e. Unlikely
5. How likely are you to recommend this program to a friend?
 - a. Never
 - b. Unlikely
 - c. Not unlikely but not likely
 - d. A little likely
 - e. Absolutely likely
6. Was coming to weekly meetings for 8 weeks reasonable?
 - a. Not reasonable at all
 - b. A little not reasonable
 - c. Not reasonable, but not unreasonable
 - d. A little reasonable
 - e. Very reasonable
7. Please provide any other comments that would be helpful to the study team:

*Adapted from Hunsley, J. (1992). *Development of the treatment acceptability questionnaire*. *Journal of Psychopathology and Behavioral Assessment*, 14, 55-64.

H.O.U.S.E. Skills Questionnaire

1. A key take-home message from the H.O.U.S.E program is that
 - a. Parents are never allowed to make mistakes
 - b. Remaining calm during a stressful experience is an important parenting skill
 - c. Routines do not help household management
 - d. Nagging and yelling are the best way to discipline
2. Meals are best for kids when they are:
 - a. Full of complaints about the food present to eat
 - b. Regular and pleasant
 - c. At a table cluttered with lots of stuff
 - d. A time when kids can sit in front of the TV and chill out
3. Based on the “Emotional Ladder” skill, when you notice yourself very stressed and at the “top of your ladder” you should:
 - a. Put your child in time-out
 - b. Use a skill that works for you to calm down, so you can handle the situation better
 - c. Yell until whoever has upset you gets the point
 - d. Reason things out immediately, even though you’re very upset
4. To increase a decrease a behavior your child does that you don’t like you can:
 - a. Reward your child when they don’t do the behavior
 - b. Punish your child for doing the behavior
 - c. Tell them to stop then walk away
 - d. Both a and b
5. To encourage your child to eat a new, healthy food, you should:
 - a. Tell them to eat it or they will have to go to time out
 - b. Offer the food with two familiar foods that they like and encourage/model trying a bite of the new food
 - c. Only let them have a food they like if they try the new food
 - d. Tell your child you will punish them if they don’t try the new food
6. What is a parent’s job at mealtime?
 - a. Make your child clear their plate
 - b. Offer several healthy choices and let your child choose from them
 - c. Offer three new food items all at once
 - d. Let your child have whatever he/she wants
7. Please select a reason that children eat, other than for hunger:
 - a. Boredom
 - b. Sadness
 - c. Anger
 - d. All of the above

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